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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|--|---------------|------------------------|
| HT4C | Uni-ZAP XR | LP03 |
| HE9F HE9H HE9M HE9N HE9O HE9P HE9Q HE9R HE9S HE9T | Uni-ZAP XR | LP13 |
| HEPA HEPB | Uni-ZAP XR | LP04 |
| HSFA | Uni-ZAP XR | LP13 |
| HATA HATB HATC HATE | Uni-ZAP XR | LP13 |
| HT3B | Uni-ZAP XR | PA005 Phage |
| HSNA | Uni-ZAP XR | LP04 |
| HPFC | Uni-ZAP XR | LP04 |
| HE2A HE2D HE2E HE2H HE2I HE2O | Uni-ZAP XR | LP13 |
| HE2B HE2C HE2F HE2P | Uni-ZAP XR | LP13 |
| HCBB | Uni-ZAP XR | NA |
| HFGA | Uni-ZAP XR | LP03 |
| HNEA HNED | Uni-ZAP XR | LP13 |
| HBGB | Uni-ZAP XR | LP03 |
| HKCA | Uni-ZAP XR | PA005 Phage |
| HKLA | Lambda ZAP II | PA005 Phage |
| HBNA | Uni-ZAP XR | LP03 |
| HCET | pBluescript | PA005 Phage |
| HKCS HKCU | pBluescript | LP03 |
| HKCT | pBluescript | PA005 Phage |
| HLIS | pBluescript | LP13 |
| HLHS HLHT | pBluescript | LP13 |
| HPRT | pBluescript | PA005 Phage |
| HPTT | Uni-ZAP XR | LP13 |
| HRGS | pBluescript | LP03 |
| HSUS | pBluescript | LP13 |
| HT2S | Uni-ZAP XR | NA |
| HCNS | pBluescript | PA005 Phage |
| HCNU | pBluescript | PA005 Phage |
| HKLR | pBluescript | PA005 Phage |
| HKLS | pBluescript | PA005 Phage |
| HKTA | Uni-ZAP XR | PA005 Phage |
| HHFU | pBluescript | NA |
| HE8S | Uni-ZAP XR | LP03 |
| HCDC HCDE | Uni-ZAP XR | LP03 |
| HOAA | Uni-ZAP XR | LP13 |
| HTLA HTLD HTLE | Uni-ZAP XR | LP03 |
| HLMD | Uni-ZAP XR | PA005 Phage |
| HLMI HLMM | Lambda Zap II | LP01 |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|-------------------------------|---------------|------------------------|
| H6EA H6EB | Uni-ZAP XR | LP03 |
| HCEV HCEY | Uni-ZAP XR | LP03 |
| HCQA HCQB | Lambda Zap II | LP01 |
| HTOA HTOD HTOH HTOJ | Uni-ZAP XR | LP13 |
| HTXC HTXF | Uni-ZAP XR | LP03 |
| HMEC HMEE HMEG HMEI HMEK | Lambda Zap II | LP01 |
| HMEB | Lambda Zap II | LP13 |
| HNFE HNFF HNFG HNFH | Uni-ZAP XR | LP03 |
| HKEA | ZAP express | PA005 Phage |
| HMGB | Uni-ZAP XR | LP13 |
| HMHB | Uni-ZAP XR | PA005 Phage |
| HAUA HAUB | Uni-ZAP XR | LP13 |
| HAQB | Uni-ZAP XR | LP13 |
| HCWH | ZAP express | LP02 |
| HCUC | ZAP express | LP02 |
| HSVB HSVC | Uni-ZAP XR | LP03 |
| HPXA | pBluescript | NA |
| HBJE HBJF HBJJ HBJM | Uni-ZAP XR | LP13 |
| HCRB | Uni-ZAP XR | LP03 |
| HODA HODB HODC HODD | Uni-ZAP XR | LP13 |
| HDSA | Uni-ZAP XR | LP03 |
| HLQA HLQB | Lambda Zap II | LP01 |
| HHGC HHGD | Lambda Zap II | LP01 |
| HCPA | Uni-ZAP XR | LP13 |
| HMWA HMWB HMWD HMWF HMWH HMWI | Uni-ZAP XR | LP03 |
| HERA | Uni-ZAP XR | LP13 |
| HGLA | Uni-ZAP XR | LP13 |
| HWTB HWTC | Uni-ZAP XR | LP13 |
| HLLC | pCMVSPORT1 | PA005 DNA |
| HLIB HLIC | pCMVSPORT1 | LP12 |
| HKDB | pCMVSPORT1 | NA |
| HRKA | pBluescript | PA005 Phage |
| HOSX | pBluescript | PA005 Phage |
| HEAA | Uni-ZAP XR | LP13 |
| HBCB HBCC | Uni-ZAP XR | LP21 |
| HHBE HHBF HHBH | pCMVSPORT1 | LP12 |
| HBBB | pCMVSPORT1 | LP12 |
| HLJB HLJD HLJE | pCMVSPORT1 | LP12 |
| HSEB | pCMVSPORT1 | NA |
| HNAA | pSPORT1 | NA |
| HBSA | Uni-ZAP XR | LP04 |
| HBBM | pCMVSPORT1 | NA |
| HADM | pBluescript | NA |
| HMKA HMKC | pSPORT1 | LP12 |
| HFVH HFVI HFVJ HFVK | pBluescript | LP03 |
| HKIM | Lambda Zap II | PA005 Phage |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|---|------------------|------------------------|
| HCUD HCUE HCUG | ZAP express | LP02 |
| HKIS | pBluescript | NA |
| HSDS | pBluescript | LP13 |
| HBAG HBAH | pSport1 | NA |
| HUSG HUSI HUSJ | pSport1 | LP10 |
| HUSX HUSY HUSZ | pSport1 | LP10 |
| HOFM | pCMVSPORT 2.0 | LP07 |
| HNFI | pBluescript | LP03 |
| HBMC HBMD | pBluescript | LP03 |
| HCFB HCFC HCFD | pSport1 | LP12 |
| HCFL HCFM HCFN HCFO | pSport1 | LP12 |
| HPTW | pBluescript | PA005 Phage |
| HADC HADF | pSport1 | LP10 |
| HOVA HOVC HOVD HOVE | pSport1 | LP10 |
| HKML HKMM | pBluescript | LP03 |
| HUSF | pBluescript | NA |
| HOGA HOGB HOGC HOGD HOGE | pCMVSPORT 2.0 | LP12 |
| HTWB HTWC HTWD HTWE HTWF | pSport1 | LP10 |
| HBXF | ZAP express | LP02 |
| HEOA | pBluescript | PA005 DNA |
| HSDX | pBluescript | LP13 |
| HMMA | pSport1 | LP12 |
| HLYA HLYB HLYC HLYD HLYE HLYG | pSport1 | LP10 |
| HCGL | pCMVSPORT 2.0 | LP07 |
| HSDZ | pBluescript | LP13 |
| HEON HEOQ HEOS | pSport1 | LP10 |
| HCGB | pSport1 | LP10 |
| HADT | pBluescript | NA |
| HTDA | pSport1 | LP12 |
| HSPA HSPB | pSport1 | LP10 |
| HSPM | pSport1 | LP10 |
| HCHA HCHB HCHC | pSport1 | LP10 |
| HCHM HCHO | pSport1 | LP10 |
| HDLA | pCMVSPORT 2.0 | LP07 |
| HDTA HDTB HDTD HDTE HDTG HDTH HDTI HDTJ HDTK HDTL HDTM | pCMVSPORT 2.0 | LP07 |
| HTJM HTJN | pCMVSPORT 2.0 | LP12 |
| HCIA | pSport1 | LP10 |
| H6BS | Uni-ZAP XR | LP03 |
| HKAA HKAB HKAC HKAD HKAE HKAF HKAH HKAJ HKAK HKAQ | pCMVSPORT 2.0 | LP07 |
| HDAA HDAB HDAC | pSport1 | LP10 |
| HUFA HUFB HUFC HUFD HUFF | pSport1 | LP10 |
| HLDB HLDC HLDD | pCMVSPORT 3.0 | LP08 |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|--|------------------|------------------------|
| HLDN HLDO | pCMVSPORT 3.0 | LP08 |
| HNDA | pCMVSPORT 2.0 | LP07 |
| HMTA HMTB | pCMVSPORT 3.0 | LP08 |
| HNTA HNTB HNTC HNTD HNTE | pCMVSPORT 3.0 | LP08 |
| HNTM | pSPORT1 | LP10 |
| HDPA HDPB HDPC HDPF HDPG HDPH HDPI HDPJ HDPK HDPL HDPR HDPS HDPT HDPV HDPW HDPX HDQD HDQE HDQF HDQG HDQH | pCMVSPORT 3.0 | LP08 |
| HDPM HDPO HDPP HDPQ HDQP | pCMVSPORT 3.0 | LP08 |
| HMTM | PCR II | LP09 |
| HLDX | pSPORT1 | LP10 |
| HMUB | pCMVSPORT 3.0 | LP08 |
| HULA HULC | pSPORT1 | LP10 |
| HFNA | pSPORT1 | LP10 |
| HKGA HKGB HKGC HKGD | pSPORT1 | LP10 |
| HISA HISB HISC HISD HISE | pSPORT1 | LP10 |
| HLSA | pSPORT1 | LP10 |
| HHEA HHEB HHEC HHED HHEE HHEF HHEG HHEH HHEI HHEJ | pCMVSPORT 3.0 | LP08 |
| HHEM HHEN HHFP HHEQ HHER HHET HHEU HHEV HHEW HHEX HHEY HHEZ | pCMVSPORT 3.0 | LP08 |
| HEQA | pCMVSPORT 3.0 | LP08 |
| HJMA HJMB | pCMVSPORT 3.0 | LP08 |
| HSWB | pCMVSPORT 3.0 | LP08 |
| HNTR HNTS HNTT | pSPORT1 | NA |
| HEEA | Uni-ZAP XR | NA |
| HEGA | Uni-ZAP XR | NA |
| HSYA HSYB HSYD HSYE | pCMVSPORT 3.0 | LP08 |
| HLWA HLWB HLWC | pCMVSPORT 3.0 | LP08 |
| HRAA HRAB HRAC HRAE | pCMVSPORT 3.0 | LP08 |
| HTXJ HTXK HTXL HTXM HTXO HTXP HTXQ HTXR HTXS | Uni-ZAP XR | LP03 |
| H6ED | Uni-ZAP XR | LP03 |
| HAMF HAMG | pCMVSPORT 3.0 | LP12 |
| HAJA HAJB | pCMVSPORT 3.0 | LP12 |
| HDFU | pCMVSPORT 2.0 | NA |
| HDHE | pCMVSPORT 2.0 | NA |
| HLQD HLQE HLQF | Lamda ZAP II | LP13 |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|-------------------------------|-----------------------|------------------------|
| HAPN HAPO HAPQ HAPR | Uni-ZAP XR | LP13 |
| HWBA HWBB HWBC HWBD HWBE HWBF | pCMVSPORT 3.0 | LP12 |
| HWAA HWAB HWAC HWAD HWAG HWAI | pCMVSPORT 3.0 | LP12 |
| HYAA HYAB HYAC | pCMVSPORT 3.0 | LP12 |
| HWHG HWHH | pCMVSPORT 3.0 | LP12 |
| HWHP HWHQ | pCMVSPORT 3.0 | LP12 |
| HCWU | ZAP Express | LP13 |
| HSIF HSIG | Uni-ZAP XR | PA005 Phage |
| HLTG HLTH HLTJ | Uni-ZAP XR | LP13 |
| HARM HARN | pCMVSPORT 3.0 | LP12 |
| HBIM HBIN HBIO HBIP | pCMVSPORT 3.0 | LP12 |
| HSOB HSOD | Uni-ZAP XR | LP03 |
| HCQC HCQD | Lambda ZAP II | LP01 |
| HCNC HCND | Lambda ZAP II | LP01 |
| HROB HROD | Uni-ZAP XR | LP03 |
| HAHC | Uni-ZAP XR | LP13 |
| HWDA | pCMVSPORT 3.0 | LP12 |
| HODE HODF HODG | Uni-ZAP XR | LP03 |
| HTEL HTEP | Uni-ZAP XR | LP03 |
| HBGM HBGN | Uni-ZAP XR | LP03 |
| HTLG HTLH | Uni-ZAP XR | LP03 |
| HHFJ HHFL HHFM | Uni-ZAP XR | LP03 |
| HFKH HFKI HFKM | Uni-ZAP XR | LP03 |
| HTPF HTPG HTPH HTPJ | Uni-ZAP XR | LP03 |
| HUVF HUVG HUVH | Uni-ZAP XR | LP03 |
| HE2J HE2L HE2R HE2T | Uni-ZAP XR | LP04 |
| HS2A | pSport1 | LP16 |
| HS2S | pSport1 | LP16 |
| HLQG | Lambda Zap II | LP01 |
| HA5A HA5B | pSport1 | LP16 |
| HTTI HTTK | Uni-ZAP XR | LP03 |
| HTAH | Uni-ZAP XR | LP03 |
| HDDN | pSport1 | LP22 |
| HPCI | Lambda Zap- CMV XR | LP21 |
| HPCR | Lambda Zap- CMV XR | LP22 |
| HPMK HPML | Uni-ZAP XR | LP03 |
| HHFO | Uni-ZAP XR | LP03 |
| HAAA | pSport1 | LP22 |
| HOOH | pSport1 | LP22 |
| HIDA | pSport1 | LP22 |
| HNOA | pSport1 | LP22 |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|---|---------------|------------------------|
| HUUA | pTriplEx2 | LP22 |
| HPDO | pSport1 | PA005 DNA |
| HPCO | pSport1 | PA005 DNA |
| HOCM | pSport1 | PA005 DNA |
| HNBT | pSport1 | PA005 DNA |
| HBCJ | pSport1 | PA005 DNA |
| HSAM | pSport1 | PA005 DNA |
| HFXA HFXH | Lambda ZAP II | LP01 |
| HMSA HMSC HMSD HMSF HMSG HMSH HMSI HMSJ | Uni-ZAP XR | LP03 |
| HOSA HOSB HOSD HOSM HOSN HOSO HOSP | Uni ZAP XR | LP04 |
| HEBA HEBB HEBF HEBG | Uni ZAP XR | NA |
| HAGB HAGD HAGE HAGF | Uni-ZAP XR | LP13 |
| HSRA HSRB | Uni-ZAP XR | LP03 |
| HPVA | Uni ZAP XR | PA005 Phage |
| HKIA | Uni ZAP XR | PA005 Phage |
| HKMA | Uni ZAP XR | NA |
| HSRF | Uni-ZAP XR | LP03 |
| HSQD HSQF | Uni-ZAP XR | LP03 |
| HSKE HSKZ | Uni-ZAP XR | LP03 |
| HSLE HSLF HSLG HSLH | Uni-ZAP XR | LP03 |
| HSDE HSDH | Uni-ZAP XR | LP03 |
| HSXA HSXB HSXD | Uni-ZAP XR | LP04 |
| HSXA HSHB | Uni-ZAP XR | LP13 |
| HBXA HBXB HBXC | ZAP Express | LP13 |
| HOUA HOUD | Uni-ZAP XR | LP04 |
| HPWA HPWB HPWC | Uni-ZAP XR | LP13 |
| HELB HELG HELH | Uni-ZAP XR | LP04 |
| HEMF HEMG | Uni-ZAP XR | LP04 |
| HBIB | Uni-ZAP XR | LP04 |
| HFRA HFRB | Uni ZAP XR | PA005 Phage |
| HHSB HHSD | Uni-ZAP XR | LP04 |
| HNGB HNGE HNGG HNGI | Uni-ZAP XR | LP04 |
| HNHD HNHE HNHH | Uni-ZAP XR | LP04 |
| HADB | Uni ZAP XR | NA |
| HSAX HSAW HSAX HSAZ | Uni-ZAP XR | LP04 |
| HBMS HBMT HBMV HBMX | Uni-ZAP XR | LP04 |
| HOBA | pBluescript | PA005 Phage |
| HOEE HOEF HOEK HOEL HOEM HOEN HOEO | Uni ZAP XR | PA005 Phage |
| HAIB HAIC HAID | Uni-ZAP XR | LP04 |
| HTGA HTGB | Uni-ZAP XR | LP04 |
| HEIB HEIC | Uni ZAP XR | NA |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|---|------------------|------------------------|
| HMCD | Uni-ZAP XR | LP04 |
| HPCA | Uni ZAP XR | NA |
| HPHA | Uni-ZAP XR | LP04 |
| HP1A HP1C | Uni-ZAP XR | LP13 |
| HP1A HP1B HP1C HP1E | Uni-ZAP XR | LP13 |
| HF1A HF1B HF1C | pSport1 | LP10 |
| HF1H HF1I HF1J | pSport1 | LP10 |
| HFIU | pSport1 | LP10 |
| HSKX | pBluescript | LP03 |
| HGCO | pSport1 | NA |
| HMVA HMVB HMVC HMVD | pSport1 | LP10 |
| HOSE HOSF | Uni-ZAP XR | LP04 |
| HNHN HNHO | Uni ZAP XR | LP04 |
| HTGE HTGF | Uni-ZAP XR | LP04 |
| HFPB HFPC HFPE HFPF HFPH HFPI HFPJ HFPK | Uni-ZAP XR | LP03 |
| HFIX HFIY HFIZ | pSport1 | LP10 |
| HOHA HOHB HOHC HOHE | pCMVSPORT 2.0 | LP07 |
| HSDJ HSDK | Uni-ZAP XR | LP03 |
| HFOX HFOY | pSport1 | LP10 |
| HMAH HMAJ HMAK HMAM | Uni-ZAP XR | LP04 |
| HACB HACC | Uni-ZAP XR | LP04 |
| HFXK | Lambda ZAP II | PA005 Phage |
| HFAT | Uni ZAP XR | PA005 Phage |
| HANG | pSport1 | NA |
| HOUH | Uni ZAP XR | NA |
| HMCF HMCB HMCH HMCJ | Uni-ZAP XR | LP13 |
| HWLE HWLF HWLG HWLH HWMA | pSport1 | LP14 |
| HCRM HCRN HCRO HCRP HCRQ | pSport1 | LP14 |
| HWLI HWLJ HWLK HWLL HWMF | pSport1 | LP14 |
| HWLQ HWLR HWLU HWLV HWLW HWLX | pSport1 | LP14 |
| HBOD HBOE | pSport1 | LP14 |
| HBKD | pSport1 | LP14 |
| HWLA HWLC HWLD HWLP | pSport1 | LP14 |
| HWLM HWLN HWLO HWMB HWMC | pSport1 | LP14 |
| HVAA | pSport1 | LP12 |
| HBWC | ZAP express | LP13 |
| HHSF HHSB | Uni ZAP XR | LP04 |
| HSLJ | Uni ZAP XR | NA |
| HAQN | pSport1 | LP14 |
| HASM | pSport1 | LP14 |
| HCDM | pSport1 | LP14 |
| HFDM | pSport1 | LP14 |
| HGAM | pSport1 | LP14 |
| HHMM | pSport1 | LP14 |
| HAVM | pT-Adv | LP14 |
| HAVT | pT-Adv | LP14 |
| HHAT HHAU | pT-Adv | LP14 |
| HUCN HUCO HUCP HUCQ | pSport1 | LP20 |
| HHAO | pCMVSPORT | LP15 |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|---------------------|--------------------|------------------------|
| | 3.0 | |
| HTFN | pSport1 | LP16 |
| HMSM HMSO HMSP | Uni ZAP XR | PA005 Phage |
| HEPN | pSport1 | LP20 |
| HPSN | pSport1 | LP20 |
| HNSA | pSport1 | LP20 |
| HNSM | pSport1 | LP20 |
| HOCN | pSport1 | LP20 |
| HOCT | pSport1 | LP20 |
| HLXN | pSport1 | LP20 |
| HTYN | pSport1 | LP20 |
| HZAA | pSport1 | LP20 |
| HINA | pSport1 | LP16 |
| HRMA | pSport1 | LP16 |
| HSKI HSKJ HSKK | pBluescript | LP03 |
| HACA | Uni-ZAP XR | LP13 |
| HFAA HFAC HFAD | Uni-ZAP XR | LP04 |
| HFAM | Uni-ZAP XR | LP04 |
| HMIA HMIB | Uni-ZAP XR | LP04 |
| HILB HILC | pBluescript SK- | PA005 Phage |
| HPBE | pBluescript SK- | LP13 |
| HIBC HIBE | Other | NA |
| HPDD | pBluescript SK- | NA |
| HSAA HSAB HSAC | pBluescript | LP05 |
| HSBA | pBluescript SK- | LP13 |
| HJAA HJAC | pBluescript SK- | LP13 |
| HJBA HJBC | pBluescript SK- | LP13 |
| HAFB | pBS | LP05 |
| HTNA HTNB | pBluescript SK- | LP13 |
| HONA | pBluescript | LP05 |
| HBMA | pBluescript SK- | NA |
| HARA | pBluescript | LP05 |
| H2CA | pBluescript SK- | NA |
| H2MA | pBluescript SK- | NA |
| H2MB H2MC | pBluescript SK- | PA005 Phage |
| H2CB | pBluescript SK- | PA005 Phage |
| HCYA | pBluescript SK- | NA |
| HCYB | pBluescript | PA005 |

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| LIBRARIES DEPOSITED | VECTOR | ATCC DEPOSIT NO. |
|---------------------|--------------------|------------------------|
| | SK- | Phage |
| H2LA H2LB | pBluescript SK- | PA005 Phage |

In many cases, the vector used to construct the library is a phage vector from which a plasmid has been excised. The table immediately below correlates the related plasmid for each phage vector used in constructing the cDNA library. For example, where a particular clone is identified in Table 1 as being isolated in the vector "Lambda Zap," the corresponding deposited clone is in "pBluescript."

| | <u>Vector Used to Construct Library</u> | <u>Corresponding Deposited Plasmid</u> |
|----|---|--|
| | Lambda Zap | pBluescript (pBS) |
| | Uni-Zap XR | pBluescript (pBS) |
| 10 | Zap Express | pBK |
| | lafmid BA | plafmid BA |
| | pSport1 | pSport1 |
| | pCMVSPORT 2.0 | pCMVSPORT 2.0 |
| | pCMVSPORT 3.0 | pCMVSPORT 3.0 |
| 15 | pCR [®] 2.1 | pCR [®] 2.1 |

Vectors Lambda Zap (U.S. Patent Nos. 5,128,256 and 5,286,636), Uni-Zap XR (U.S. Patent Nos. 5,128, 256 and 5,286,636), Zap Express (U.S. Patent Nos. 5,128,256 and 5,286,636), pBluescript (pBS) (Short, J. M. et al., Nucleic Acids Res. 16:7583-7600 (1988); Altting-Mees, M. A. and Short, J. M., Nucleic Acids Res. 17:9494 (1989)) and pBK (Altting-Mees, M. A. et al., Strategies 5:58-61 (1992)) are commercially available from Stratagene Cloning Systems, Inc., 11011 N. Torrey Pines Road, La Jolla, CA, 92037. pBS contains an ampicillin resistance gene and pBK contains a neomycin resistance gene. Both can be transformed into E. coli strain XL-1 Blue, also available from Stratagene. pBS comes in 4 forms SK⁺, SK⁻, KS⁺ and KS. The S and K refers to the orientation of the polylinker to the T7 and T3 primer sequences which flank the polylinker region ("S" is for SacI and "K" is for KpnI which are the first sites on each respective end of the linker). "+" or "-" refer to the orientation of the fl origin of replication ("ori"), such that in one orientation, single stranded rescue initiated from the fl ori generates sense strand DNA and in the other, antisense.

Vectors pSport1, pCMVSPORT 2.0 and pCMVSPORT 3.0, were obtained from Life Technologies, Inc., P. O. Box 6009, Gaithersburg, MD 20897. All Sport vectors contain an ampicillin resistance gene and may be transformed into E. coli strain DH10B, also available from Life Technologies. (See, for instance, Gruber, C. E., et al., Focus 15:59 (1993).)

Vector lafmid·BA (Bento Soares, Columbia University, NY) contains an ampicillin resistance gene and can be transformed into E. coli strain XL-1 Blue. Vector pCR[®]2.1, which is available from Invitrogen, 1600 Faraday Avenue, Carlsbad, CA 92008, contains an ampicillin resistance gene and may be transformed into E. coli strain DH10B, available from
5 Life Technologies. (See, for instance, Clark, J. M., Nuc. Acids Res. 16:9677-9686 (1988) and Mead, D. et al., Bio/Technology 9: (1991).) Preferably, a polynucleotide of the present invention does not comprise the phage vector sequences identified for the particular clone in Table 1, as well as the corresponding plasmid vector sequences designated above.

The deposited material in the sample assigned the ATCC Deposit Number cited in
10 Table 2 for any given cDNA clone also may contain one or more additional plasmids, each comprising a cDNA clone different from that given clone. Thus, deposits sharing the same ATCC Deposit Number contain at least a plasmid for each cDNA clone identified in Table 1. Typically, each ATCC deposit sample cited in Table 2 comprises a mixture of approximately equal amounts (by weight) of about 50 plasmid DNAs, each containing a different cDNA
15 clone; but such a deposit sample may include plasmids for more or less than 50 cDNA clones, up to about 500 cDNA clones.

Two approaches can be used to isolate a particular clone from the deposited sample of plasmid DNAs cited for that library in Table 2 and 9. First, a plasmid is directly isolated by screening the libraries using a polynucleotide probe corresponding to SEQ ID NO:X.

20 Particularly, a specific polynucleotide with 30-40 nucleotides is synthesized using an Applied Biosystems DNA synthesizer according to the sequence reported. The oligonucleotide is labeled, for instance, with ³²P-γ-ATP using T4 polynucleotide kinase and purified according to routine methods. (E.g., Maniatis et al., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Press, Cold Spring, NY (1982).) The plasmid
25 mixture is transformed into a suitable host, as indicated above (such as XL-1 Blue (Stratagene)) using techniques known to those of skill in the art, such as those provided by the vector supplier or in related publications or patents cited above. The transformants are plated on 1.5% agar plates (containing the appropriate selection agent, e.g., ampicillin) to a density of about 150 transformants (colonies) per plate. These plates are screened using
30 Nylon membranes according to routine methods for bacterial colony screening (e.g., Sambrook et al., Molecular Cloning: A Laboratory Manual, 2nd Edit., (1989), Cold Spring

Harbor Laboratory Press, pages 1.93 to 1.104), or other techniques known to those of skill in the art.

Alternatively, two primers of 17-20 nucleotides derived from both ends of the SEQ ID NO:X (i.e., within the region of SEQ ID NO:X bounded by the 5' NT and the 3' NT of the clone defined in Table 1) are synthesized and used to amplify the desired cDNA using the deposited cDNA plasmid as a template. The polymerase chain reaction is carried out under routine conditions, for instance, in 25 μ l of reaction mixture with 0.5 ug of the above cDNA template. A convenient reaction mixture is 1.5-5 mM $MgCl_2$, 0.01% (w/v) gelatin, 20 μ M each of dATP, dCTP, dGTP, dTTP, 25 pmol of each primer and 0.25 Unit of Taq polymerase. Thirty five cycles of PCR (denaturation at 94°C for 1 min; annealing at 55°C for 1 min; elongation at 72°C for 1 min) are performed with a Perkin-Elmer Cetus automated thermal cycler. The amplified product is analyzed by agarose gel electrophoresis and the DNA band with expected molecular weight is excised and purified. The PCR product is verified to be the selected sequence by subcloning and sequencing the DNA product.

Several methods are available for the identification of the 5' or 3' non-coding portions of a gene which may not be present in the deposited clone. These methods include but are not limited to, filter probing, clone enrichment using specific probes, and protocols similar or identical to 5' and 3' "RACE" protocols which are well known in the art. For instance, a method similar to 5' RACE is available for generating the missing 5' end of a desired full-length transcript. (Fromont-Racine et al., Nucleic Acids Res. 21(7):1683-1684 (1993).)

Briefly, a specific RNA oligonucleotide is ligated to the 5' ends of a population of RNA presumably containing full-length gene RNA transcripts. A primer set containing a primer specific to the ligated RNA oligonucleotide and a primer specific to a known sequence of the gene of interest is used to PCR amplify the 5' portion of the desired full-length gene. This amplified product may then be sequenced and used to generate the full length gene.

This above method starts with total RNA isolated from the desired source, although poly-A⁺ RNA can be used. The RNA preparation can then be treated with phosphatase if necessary to eliminate 5' phosphate groups on degraded or damaged RNA which may interfere with the later RNA ligase step. The phosphatase should then be inactivated and the RNA treated with tobacco acid pyrophosphatase in order to remove the cap structure present at the 5' ends of messenger RNAs. This reaction leaves a 5' phosphate group at the 5' end of

the cap cleaved RNA which can then be ligated to an RNA oligonucleotide using T4 RNA ligase.

This modified RNA preparation is used as a template for first strand cDNA synthesis using a gene specific oligonucleotide. The first strand synthesis reaction is used as a template
5 for PCR amplification of the desired 5' end using a primer specific to the ligated RNA oligonucleotide and a primer specific to the known sequence of the gene of interest. The resultant product is then sequenced and analyzed to confirm that the 5' end sequence belongs to the desired gene.

10 ***Example 2: Isolation of Genomic Clones Corresponding to a Polynucleotide***

A human genomic P1 library (Genomic Systems, Inc.) is screened by PCR using primers selected for the cDNA sequence corresponding to SEQ ID NO:X., according to the method described in Example 1. (See also, Sambrook.)

15

Example 3: Tissue specific expression analysis

The Human Genome Sciences, Inc. (HGS) database is derived from sequencing tissue specific cDNA libraries. Libraries generated from a particular tissue (e.g., those shown in
20 Table 3 and 5) are selected and the specific tissue expression pattern of EST groups or assembled contigs within these libraries is determined by comparison of the expression patterns of those groups or contigs within the entire database. ESTs which are predicted to have significantly enhances expression in colon or colon cancer tissues were selected.

The original clone from which the specific EST sequence was generated, is obtained
25 from the catalogued library of clones and the insert amplified by PCR using methods known in the art. The PCR product is denatured then transferred in 96 well format to a nylon membrane (Schleicher and Scheull) generating an array filter of colon and/or colon cancer related clones. Housekeeping genes, maize genes, known tissue specific genes and known membranè localized class I genes are included on the filters as controls. These targets can be
30 used in signal normalization and to validate assay sensitivity. Additional targets are included to monitor probe length and specificity of hybridization.

Radioactively labeled hybridization probes are generated by first strand cDNA synthesis per the manufacturer's instructions (Life Technologies) from mRNA/RNA samples prepared from the specific tissue being analyzed. The hybridization probes are purified by gel exclusion chromatography, quantitated, and hybridized with the array filters in hybridization bottles at 65°C overnight. The filters are washed under stringent conditions and signals are captured using a Fuji phosphorimager.

Data is extracted using AIS software and following background subtraction, signal normalization is performed. This includes a normalization of filter-wide expression levels between different experimental runs. Genes that are differentially expressed in the tissue of interest are identified and the full length sequence of these clones is generated.

Example 4: Chromosomal Mapping of the Polynucleotides

An oligonucleotide primer set is designed according to the sequence at the 5' end of SEQ ID NO:X. This primer preferably spans about 100 nucleotides. This primer set is then used in a polymerase chain reaction under the following set of conditions : 30 seconds, 95°C; 1 minute, 56°C; 1 minute, 70°C. This cycle is repeated 32 times followed by one 5 minute cycle at 70°C. Human, mouse, and hamster DNA is used as template in addition to a somatic cell hybrid panel containing individual chromosomes or chromosome fragments (Bios, Inc). The reactions is analyzed on either 8% polyacrylamide gels or 3.5 % agarose gels. Chromosome mapping is determined by the presence of an approximately 100 bp PCR fragment in the particular somatic cell hybrid.

Example 5: Bacterial Expression of a Polypeptide

A polynucleotide encoding a polypeptide of the present invention is amplified using PCR oligonucleotide primers corresponding to the 5' and 3' ends of the DNA sequence, as outlined in Example 1, to synthesize insertion fragments. The primers used to amplify the cDNA insert should preferably contain restriction sites, such as BamHI and XbaI, at the 5' end of the primers in order to clone the amplified product into the expression vector. For example, BamHI and XbaI correspond to the restriction enzyme sites on the bacterial

expression vector pQE-9. (Qiagen, Inc., Chatsworth, CA). This plasmid vector encodes antibiotic resistance (Ampr), a bacterial origin of replication (ori), an IPTG-regulatable promoter/operator (P/O), a ribosome binding site (RBS), a 6-histidine tag (6-His), and restriction enzyme cloning sites.

5 The pQE-9 vector is digested with BamHI and XbaI and the amplified fragment is ligated into the pQE-9 vector maintaining the reading frame initiated at the bacterial RBS. The ligation mixture is then used to transform the E. coli strain M15/rep4 (Qiagen, Inc.) which contains multiple copies of the plasmid pREP4, which expresses the lacI repressor and also confers kanamycin resistance (Kanr). Transformants are identified by their ability to
10 grow on LB plates and ampicillin/kanamycin resistant colonies are selected. Plasmid DNA is isolated and confirmed by restriction analysis.

Clones containing the desired constructs are grown overnight (O/N) in liquid culture in LB media supplemented with both Amp (100 ug/ml) and Kan (25 ug/ml). The O/N culture is used to inoculate a large culture at a ratio of 1:100 to 1:250. The cells are grown to an optical
15 density 600 (O.D.⁶⁰⁰) of between 0.4 and 0.6. IPTG (Isopropyl-B-D-thiogalacto pyranoside) is then added to a final concentration of 1 mM. IPTG induces by inactivating the lacI repressor, clearing the P/O leading to increased gene expression.

Cells are grown for an extra 3 to 4 hours. Cells are then harvested by centrifugation (20 mins at 6000Xg). The cell pellet is solubilized in the chaotropic agent 6 Molar
20 Guanidine HCl by stirring for 3-4 hours at 4°C. The cell debris is removed by centrifugation, and the supernatant containing the polypeptide is loaded onto a nickel-nitrilo-tri-acetic acid ("Ni-NTA") affinity resin column (available from QIAGEN, Inc., *supra*). Proteins with a 6 x His tag bind to the Ni-NTA resin with high affinity and can be purified in a simple one-step procedure (for details see: The QIAexpressionist (1995) QIAGEN, Inc., *supra*).

25 Briefly, the supernatant is loaded onto the column in 6 M guanidine-HCl, pH 8, the column is first washed with 10 volumes of 6 M guanidine-HCl, pH 8, then washed with 10 volumes of 6 M guanidine-HCl pH 6, and finally the polypeptide is eluted with 6 M guanidine-HCl, pH 5.

The purified protein is then renatured by dialyzing it against phosphate-buffered
30 saline (PBS) or 50 mM Na-acetate, pH 6 buffer plus 200 mM NaCl. Alternatively, the protein can be successfully refolded while immobilized on the Ni-NTA column. The recommended conditions are as follows: renature using a linear 6M-1M urea gradient in 500

mM NaCl, 20% glycerol, 20 mM Tris/HCl pH 7.4, containing protease inhibitors. The renaturation should be performed over a period of 1.5 hours or more. After renaturation the proteins are eluted by the addition of 250 mM imidazole. Imidazole is removed by a final dialyzing step against PBS or 50 mM sodium acetate pH 6 buffer plus 200 mM NaCl.

5 The purified protein is stored at 4° C or frozen at -80° C.

In addition to the above expression vector, the present invention further includes an expression vector comprising phage operator and promoter elements operatively linked to a polynucleotide of the present invention, called pHE4a. (ATCC Accession Number 209645, deposited on February 25, 1998.) This vector contains: 1) a neomycinphosphotransferase
10 gene as a selection marker, 2) an E. coli origin of replication, 3) a T5 phage promoter sequence, 4) two lac operator sequences, 5) a Shine-Delgarno sequence, and 6) the lactose operon repressor gene (lacIq). The origin of replication (oriC) is derived from pUC19 (LTI, Gaithersburg, MD). The promoter sequence and operator sequences are made synthetically.

DNA can be inserted into the pHEa by restricting the vector with NdeI and XbaI,
15 BamHI, XhoI, or Asp718, running the restricted product on a gel, and isolating the larger fragment (the stuffer fragment should be about 310 base pairs). The DNA insert is generated according to the PCR protocol described in Example 1, using PCR primers having restriction sites for NdeI (5' primer) and XbaI, BamHI, XhoI, or Asp718 (3' primer). The PCR insert is gel purified and restricted with compatible enzymes. The insert and vector are ligated
20 according to standard protocols.

The engineered vector could easily be substituted in the above protocol to express protein in a bacterial system.

Example 6: Purification of a Polypeptide from an Inclusion Body

25

The following alternative method can be used to purify a polypeptide expressed in *E. coli* when it is present in the form of inclusion bodies. Unless otherwise specified, all of the following steps are conducted at 4-10°C.

Upon completion of the production phase of the *E. coli* fermentation, the cell culture
30 is cooled to 4-10°C and the cells harvested by continuous centrifugation at 15,000 rpm (Heraeus Sepatech). On the basis of the expected yield of protein per unit weight of cell paste and the amount of purified protein required, an appropriate amount of cell paste, by

weight, is suspended in a buffer solution containing 100 mM Tris, 50 mM EDTA, pH 7.4. The cells are dispersed to a homogeneous suspension using a high shear mixer.

The cells are then lysed by passing the solution through a microfluidizer (Microfluidics, Corp. or APV Gaulin, Inc.) twice at 4000-6000 psi. The homogenate is then
5 mixed with NaCl solution to a final concentration of 0.5 M NaCl, followed by centrifugation at 7000 xg for 15 min. The resultant pellet is washed again using 0.5M NaCl, 100 mM Tris, 50 mM EDTA, pH 7.4.

The resulting washed inclusion bodies are solubilized with 1.5 M guanidine hydrochloride (GuHCl) for 2-4 hours. After 7000 xg centrifugation for 15 min., the pellet is
10 discarded and the polypeptide containing supernatant is incubated at 4°C overnight to allow further GuHCl extraction.

Following high speed centrifugation (30,000 xg) to remove insoluble particles, the GuHCl solubilized protein is refolded by quickly mixing the GuHCl extract with 20 volumes of buffer containing 50 mM sodium, pH 4.5, 150 mM NaCl, 2 mM EDTA by vigorous
15 stirring. The refolded diluted protein solution is kept at 4°C without mixing for 12 hours prior to further purification steps.

To clarify the refolded polypeptide solution, a previously prepared tangential filtration unit equipped with 0.16 µm membrane filter with appropriate surface area (e.g., Filtron), equilibrated with 40 mM sodium acetate, pH 6.0 is employed. The filtered sample is
20 loaded onto a cation exchange resin (e.g., Poros HS-50, Perseptive Biosystems). The column is washed with 40 mM sodium acetate, pH 6.0 and eluted with 250 mM, 500 mM, 1000 mM, and 1500 mM NaCl in the same buffer, in a stepwise manner. The absorbance at 280 nm of the effluent is continuously monitored. Fractions are collected and further analyzed by SDS-PAGE.

Fractions containing the polypeptide are then pooled and mixed with 4 volumes of water. The diluted sample is then loaded onto a previously prepared set of tandem columns of strong anion (Poros HQ-50, Perseptive Biosystems) and weak anion (Poros CM-20, Perseptive Biosystems) exchange resins. The columns are equilibrated with 40 mM sodium acetate, pH 6.0. Both columns are washed with 40 mM sodium acetate, pH 6.0, 200 mM
30 NaCl. The CM-20 column is then eluted using a 10 column volume linear gradient ranging from 0.2 M NaCl, 50 mM sodium acetate, pH 6.0 to 1.0 M NaCl, 50 mM sodium acetate, pH

6.5. Fractions are collected under constant A_{280} monitoring of the effluent. Fractions containing the polypeptide (determined, for instance, by 16% SDS-PAGE) are then pooled.

The resultant polypeptide should exhibit greater than 95% purity after the above refolding and purification steps. No major contaminant bands should be observed from
5 Commassie blue stained 16% SDS-PAGE gel when 5 μ g of purified protein is loaded. The purified protein can also be tested for endotoxin/LPS contamination, and typically the LPS content is less than 0.1 ng/ml according to LAL assays.

Example 7: Cloning and Expression of a Polypeptide in a Baculovirus

10

Expression System

In this example, the plasmid shuttle vector pA2 is used to insert a polynucleotide into a baculovirus to express a polypeptide. This expression vector contains the strong polyhedrin promoter of the *Autographa californica* nuclear polyhedrosis virus (AcMNPV) followed by
15 convenient restriction sites such as BamHI, Xba I and Asp718. The polyadenylation site of the simian virus 40 ("SV40") is used for efficient polyadenylation. For easy selection of recombinant virus, the plasmid contains the beta-galactosidase gene from *E. coli* under control of a weak *Drosophila* promoter in the same orientation, followed by the polyadenylation signal of the polyhedrin gene. The inserted genes are flanked on both sides
20 by viral sequences for cell-mediated homologous recombination with wild-type viral DNA to generate a viable virus that express the cloned polynucleotide.

Many other baculovirus vectors can be used in place of the vector above, such as pAc373, pVL941, and pAcIM1, as one skilled in the art would readily appreciate, as long as the construct provides appropriately located signals for transcription, translation, secretion
25 and the like, including a signal peptide and an in-frame AUG as required. Such vectors are described, for instance, in Luckow et al., Virology 170:31-39 (1989).

Specifically, the cDNA sequence contained in the deposited clone, including the AUG initiation codon, is amplified using the PCR protocol described in Example 1. If a naturally occurring signal sequence is used to produce a colon or colon cancer related
30 polypeptide, the pA2 vector does not need a second signal peptide. Alternatively, the vector can be modified (pA2 GP) to include a baculovirus leader sequence, using the standard methods described in Summers et al., "A Manual of Methods for Baculovirus Vectors and

Insect Cell Culture Procedures," Texas Agricultural Experimental Station Bulletin No. 1555 (1987).

The amplified fragment is isolated from a 1% agarose gel using a commercially available kit ("Geneclean," BIO 101 Inc., La Jolla, Ca.). The fragment then is digested with
5 appropriate restriction enzymes and again purified on a 1% agarose gel.

The plasmid is digested with the corresponding restriction enzymes and optionally, can be dephosphorylated using calf intestinal phosphatase, using routine procedures known in the art. The DNA is then isolated from a 1% agarose gel using a commercially available kit ("Geneclean" BIO 101 Inc., La Jolla, Ca.).

10 The fragment and the dephosphorylated plasmid are ligated together with T4 DNA ligase. *E. coli* HB101 or other suitable *E. coli* hosts such as XL-1 Blue (Stratagene Cloning Systems, La Jolla, CA) cells are transformed with the ligation mixture and spread on culture plates. Bacteria containing the plasmid are identified by digesting DNA from individual colonies and analyzing the digestion product by gel electrophoresis. The sequence of the
15 cloned fragment is confirmed by DNA sequencing.

Five μ g of a plasmid containing the polynucleotide is co-transfected with 1.0 μ g of a commercially available linearized baculovirus DNA ("BaculoGold™ baculovirus DNA", Pharmingen, San Diego, CA), using the lipofection method described by Felgner et al., Proc. Natl. Acad. Sci. USA 84:7413-7417 (1987). One μ g of BaculoGold™ virus DNA and 5 μ g
20 of the plasmid are mixed in a sterile well of a microtiter plate containing 50 μ l of serum-free Grace's medium (Life Technologies Inc., Gaithersburg, MD). Afterwards, 10 μ l Lipofectin plus 90 μ l Grace's medium are added, mixed and incubated for 15 minutes at room temperature. Then the transfection mixture is added drop-wise to Sf9 insect cells (ATCC CRL 1711) seeded in a 35 mm tissue culture plate with 1 ml Grace's medium without serum.
25 The plate is then incubated for 5 hours at 27° C. The transfection solution is then removed from the plate and 1 ml of Grace's insect medium supplemented with 10% fetal calf serum is added. Cultivation is then continued at 27° C for four days.

After four days the supernatant is collected and a plaque assay is performed, as described by Summers and Smith, *supra*. An agarose gel with "Blue Gal" (Life Technologies
30 Inc., Gaithersburg) is used to allow easy identification and isolation of gal-expressing clones, which produce blue-stained plaques. (A detailed description of a "plaque assay" of this type can also be found in the user's guide for insect cell culture and baculovirology distributed by

Life Technologies Inc., Gaithersburg, page 9- 10.) After appropriate incubation, blue stained plaques are picked with the tip of a micropipettor (e.g., Eppendorf). The agar containing the recombinant viruses is then resuspended in a microcentrifuge tube containing 200 µl of Grace's medium and the suspension containing the recombinant baculovirus is used to infect Sf9 cells seeded in 35 mm dishes. Four days later the supernatants of these culture dishes are harvested and then they are stored at 4° C.

To verify the expression of the polypeptide, Sf9 cells are grown in Grace's medium supplemented with 10% heat-inactivated FBS. The cells are infected with the recombinant baculovirus containing the polynucleotide at a multiplicity of infection ("MOI") of about 2.

If radiolabeled proteins are desired, 6 hours later the medium is removed and is replaced with SF900 II medium minus methionine and cysteine (available from Life Technologies Inc., Rockville, MD). After 42 hours, 5 µCi of ³⁵S-methionine and 5 µCi ³⁵S-cysteine (available from Amersham) are added. The cells are further incubated for 16 hours and then are harvested by centrifugation. The proteins in the supernatant as well as the intracellular proteins are analyzed by SDS-PAGE followed by autoradiography (if radiolabeled).

Microsequencing of the amino acid sequence of the amino terminus of purified protein may be used to determine the amino terminal sequence of the produced protein.

Example 8: Expression of a Polypeptide in Mammalian Cells

The polypeptide of the present invention can be expressed in a mammalian cell. A typical mammalian expression vector contains a promoter element, which mediates the initiation of transcription of mRNA, a protein coding sequence, and signals required for the termination of transcription and polyadenylation of the transcript. Additional elements include enhancers, Kozak sequences and intervening sequences flanked by donor and acceptor sites for RNA splicing. Highly efficient transcription is achieved with the early and late promoters from SV40, the long terminal repeats (LTRs) from Retroviruses, e.g., RSV, HTLV1, HIV1 and the early promoter of the cytomegalovirus (CMV). However, cellular elements can also be used (e.g., the human actin promoter).

Suitable expression vectors for use in practicing the present invention include, for example, vectors such as pSVL and pMSG (Pharmacia, Uppsala, Sweden), pRSVcat (ATCC 37152), pSV2dhfr (ATCC 37146), pBC12MI (ATCC 67109), pCMVSPORT 2.0, and

pCMVSPORT 3.0. Mammalian host cells that could be used include, human HeLa, 293, H9 and Jurkat cells, mouse NIH3T3 and C127 cells, Cos 1, Cos 7 and CV1, quail QC1-3 cells, mouse L cells and Chinese hamster ovary (CHO) cells.

Alternatively, the polypeptide can be expressed in stable cell lines containing the polynucleotide integrated into a chromosome. The co-transfection with a selectable marker such as DHFR, gpt, neomycin, hygromycin allows the identification and isolation of the transfected cells.

The transfected gene can also be amplified to express large amounts of the encoded protein. The DHFR (dihydrofolate reductase) marker is useful in developing cell lines that carry several hundred or even several thousand copies of the gene of interest. (See, e.g., Alt, F. W., et al., J. Biol. Chem. 253:1357-1370 (1978); Hamlin, J. L. and Ma, C., Biochem. et Biophys. Acta, 1097:107-143 (1990); Page, M. J. and Sydenham, M. A., Biotechnology 9:64-68 (1991).) Another useful selection marker is the enzyme glutamine synthase (GS) (Murphy et al., Biochem J. 227:277-279 (1991); Bebbington et al., Bio/Technology 10:169-175 (1992). Using these markers, the mammalian cells are grown in selective medium and the cells with the highest resistance are selected. These cell lines contain the amplified gene(s) integrated into a chromosome. Chinese hamster ovary (CHO) and NSO cells are often used for the production of proteins.

Derivatives of the plasmid pSV2-dhfr (ATCC Accession No. 37146), the expression vectors pC4 (ATCC Accession No. 209646) and pC6 (ATCC Accession No. 209647) contain the strong promoter (LTR) of the Rous Sarcoma Virus (Cullen et al., Molecular and Cellular Biology, 438-447 (March, 1985)) plus a fragment of the CMV-enhancer (Boshart et al., Cell 41:521-530 (1985).) Multiple cloning sites, e.g., with the restriction enzyme cleavage sites BamHI, XbaI and Asp718, facilitate the cloning of the gene of interest. The vectors also contain the 3' intron, the polyadenylation and termination signal of the rat preproinsulin gene, and the mouse DHFR gene under control of the SV40 early promoter.

Specifically, the plasmid pC6, for example, is digested with appropriate restriction enzymes and then dephosphorylated using calf intestinal phosphatase by procedures known in the art. The vector is then isolated from a 1% agarose gel.

A polynucleotide of the present invention is amplified according to the protocol outlined in Example 1. If a naturally occurring signal sequence is used to produce the colon or colon cancer related polypeptide, the vector does not need a second signal peptide.

Alternatively, if a naturally occurring signal sequence is not used, the vector can be modified to include a heterologous signal sequence. (See, e.g., WO 96/34891.)

The amplified fragment is isolated from a 1% agarose gel using a commercially available kit ("Geneclean," BIO 101 Inc., La Jolla, Ca.). The fragment then is digested with
5 appropriate restriction enzymes and again purified on a 1% agarose gel.

The amplified fragment is then digested with the same restriction enzyme and purified on a 1% agarose gel. The isolated fragment and the dephosphorylated vector are then ligated with T4 DNA ligase. *E. coli* HB101 or XL-1 Blue cells are then transformed and bacteria are identified that contain the fragment inserted into plasmid pC6 using, for instance, restriction
10 enzyme analysis.

Chinese hamster ovary cells lacking an active DHFR gene is used for transfection. Five μ g of the expression plasmid pC6 or pC4 is cotransfected with 0.5 μ g of the plasmid pSVneo using lipofectin (Felgner et al., *supra*). The plasmid pSV2-neo contains a dominant selectable marker, the *neo* gene from Tn5 encoding an enzyme that confers resistance to a
15 group of antibiotics including G418. The cells are seeded in alpha minus MEM supplemented with 1 mg/ml G418. After 2 days, the cells are trypsinized and seeded in hybridoma cloning plates (Greiner, Germany) in alpha minus MEM supplemented with 10, 25, or 50 ng/ml of methotrexate plus 1 mg/ml G418. After about 10-14 days single clones are trypsinized and then seeded in 6-well petri dishes or 10 ml flasks using different
20 concentrations of methotrexate (50 nM, 100 nM, 200 nM, 400 nM, 800 nM). Clones growing at the highest concentrations of methotrexate are then transferred to new 6-well plates containing even higher concentrations of methotrexate (1 μ M, 2 μ M, 5 μ M, 10 mM, 20 mM). The same procedure is repeated until clones are obtained which grow at a concentration of 100 - 200 μ M. Expression of the desired gene product is analyzed, for
25 instance, by SDS-PAGE and Western blot or by reversed phase HPLC analysis.

Example 9: Protein Fusions

The polypeptides of the present invention are preferably fused to other proteins.
30 These fusion proteins can be used for a variety of applications. For example, fusion of the present polypeptides to His-tag, HA-tag, protein A, IgG domains, and maltose binding protein facilitates purification. (See Example 5; see also EP A 394,827; Traunecker, et al.,

Nature 331:84-86 (1988).) Similarly, fusion to IgG-1, IgG-3, and albumin increases the half-life time in vivo. Nuclear localization signals fused to the polypeptides of the present invention can target the protein to a specific subcellular localization, while covalent heterodimer or homodimers can increase or decrease the activity of a fusion protein. Fusion proteins can also create chimeric molecules having more than one function. Finally, fusion proteins can increase solubility and/or stability of the fused protein compared to the non-fused protein. All of the types of fusion proteins described above can be made by modifying the following protocol, which outlines the fusion of a polypeptide to an IgG molecule, or the protocol described in Example 5.

Briefly, the human Fc portion of the IgG molecule can be PCR amplified, using primers that span the 5' and 3' ends of the sequence described below. These primers also should have convenient restriction enzyme sites that will facilitate cloning into an expression vector, preferably a mammalian expression vector.

For example, if pC4 (Accession No. 209646) is used, the human Fc portion can be ligated into the BamHI cloning site. Note that the 3' BamHI site should be destroyed. Next, the vector containing the human Fc portion is re-restricted with BamHI, linearizing the vector, and a polynucleotide of the present invention, isolated by the PCR protocol described in Example 1, is ligated into this BamHI site. Note that the polynucleotide is cloned without a stop codon, otherwise a fusion protein will not be produced.

If the naturally occurring signal sequence is used to produce the colon or colon cancer related polypeptide, pC4 does not need a second signal peptide. Alternatively, if the naturally occurring signal sequence is not used, the vector can be modified to include a heterologous signal sequence. (See, e.g., WO 96/34891.)

Human IgG Fc region:

```
GGGATCCGGAGCCCAAATCTTCTGACAAAACCTCACACATGCCCACCGTGCCCAG
CACCTGAATTCGAGGGTGCACCGTCAGTCTTCCTCTTCCCCCAAACCCAAGGA
CACCTCATGATCTCCCGGACTCCTGAGGTCACATGCGTGGTGGTGGACGTAAGC
CACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCAT
AATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTC
AGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGC
AAGGTCTCCAACAAAGCCCTCCCAACCCCCATCGAGAAAACCATCTCCAAAGCC
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AAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAG
CTGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCAAGC
GACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACACTACAAGAC
CACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACC
5 GTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCAT
GAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAAT
GAGTGCGACGGCCGCGACTCTAGAGGAT (SEQ ID NO:8555)

Example 10: Production of an Antibody from a Polypeptide

10

a) Hybridoma Technology

The antibodies of the present invention can be prepared by a variety of methods. (See, Current Protocols, Chapter 2.) As one example of such methods, cells expressing polypeptide of the present invention are administered to an animal to induce the production
15 of sera containing polyclonal antibodies. In a preferred method, a preparation of polypeptide of the present invention is prepared and purified to render it substantially free of natural contaminants. Such a preparation is then introduced into an animal in order to produce polyclonal antisera of greater specific activity.

Monoclonal antibodies specific for polypeptide of the present invention are prepared
20 using hybridoma technology. (Kohler et al., Nature 256:495 (1975); Kohler et al., Eur. J. Immunol. 6:511 (1976); Kohler et al., Eur. J. Immunol. 6:292 (1976); Hammerling et al., in: Monoclonal Antibodies and T-Cell Hybridomas, Elsevier, N.Y., pp. 563-681 (1981)). In general, an animal (preferably a mouse) is immunized with polypeptide of the present invention or, more preferably, with a secreted polypeptide of the present invention-
25 expressing cell. Such polypeptide-expressing cells are cultured in any suitable tissue culture medium, preferably in Earle's modified Eagle's medium supplemented with 10% fetal bovine serum (inactivated at about 56°C), and supplemented with about 10 g/l of nonessential amino acids, about 1,000 U/ml of penicillin, and about 100 µg/ml of streptomycin.

The splenocytes of such mice are extracted and fused with a suitable myeloma cell
30 line. Any suitable myeloma cell line may be employed in accordance with the present invention; however, it is preferable to employ the parent myeloma cell line (SP2O), available

from the ATCC. After fusion, the resulting hybridoma cells are selectively maintained in HAT medium, and then cloned by limiting dilution as described by Wands et al. (Gastroenterology 80:225-232 (1981)). The hybridoma cells obtained through such a selection are then assayed to identify clones which secrete antibodies capable of binding the polypeptide of the present invention.

Alternatively, additional antibodies capable of binding to polypeptide of the present invention can be produced in a two-step procedure using anti-idiotypic antibodies. Such a method makes use of the fact that antibodies are themselves antigens, and therefore, it is possible to obtain an antibody which binds to a second antibody. In accordance with this method, protein specific antibodies are used to immunize an animal, preferably a mouse. The splenocytes of such an animal are then used to produce hybridoma cells, and the hybridoma cells are screened to identify clones which produce an antibody whose ability to bind to the polypeptide of the present invention-specific antibody can be blocked by polypeptide of the present invention. Such antibodies comprise anti-idiotypic antibodies to the polypeptide of the present invention-specific antibody and are used to immunize an animal to induce formation of further polypeptide of the present invention-specific antibodies.

For in vivo use of antibodies in humans, an antibody is "humanized". Such antibodies can be produced using genetic constructs derived from hybridoma cells producing the monoclonal antibodies described above. Methods for producing chimeric and humanized antibodies are known in the art and are discussed herein. (See, for review, Morrison, Science 229:1202 (1985); Oi et al., BioTechniques 4:214 (1986); Cabilly et al., U.S. Patent No. 4,816,567; Taniguchi et al., EP 171496; Morrison et al., EP 173494; Neuberger et al., WO 8601533; Robinson et al., WO 8702671; Boulianne et al., Nature 312:643 (1984); Neuberger et al., Nature 314:268 (1985).)

b) Isolation Of Antibody Fragments Directed Against Polypeptide of the Present Invention From A Library Of scFvs

Naturally occurring V-genes isolated from human PBLs are constructed into a library of antibody fragments which contain reactivities against polypeptide of the present invention to which the donor may or may not have been exposed (see e.g., U.S. Patent 5,885,793 incorporated herein by reference in its entirety).

Rescue of the Library. A library of scFvs is constructed from the RNA of human

PBLs as described in PCT publication WO 92/01047. To rescue phage displaying antibody fragments, approximately 10⁹ E. coli harboring the phagemid are used to inoculate 50 ml of 2xTY containing 1% glucose and 100 µg/ml of ampicillin (2xTY-AMP-GLU) and grown to an O.D. of 0.8 with shaking. Five ml of this culture is used to inoculate 50 ml of 2xTY-AMP-GLU, 2 x 10⁸ TU of delta gene 3 helper (M13 delta gene III, see PCT publication WO 92/01047) are added and the culture incubated at 37°C for 45 minutes without shaking and then at 37°C for 45 minutes with shaking. The culture is centrifuged at 4000 r.p.m. for 10 min. and the pellet resuspended in 2 liters of 2xTY containing 100 µg/ml ampicillin and 50 µg/ml kanamycin and grown overnight. Phage are prepared as described in PCT publication WO 92/01047.

M13 delta gene III is prepared as follows: M13 delta gene III helper phage does not encode gene III protein, hence the phage(mid) displaying antibody fragments have a greater avidity of binding to antigen. Infectious M13 delta gene III particles are made by growing the helper phage in cells harboring a pUC19 derivative supplying the wild type gene III protein during phage morphogenesis. The culture is incubated for 1 hour at 37° C without shaking and then for a further hour at 37°C with shaking. Cells are spun down (IEC-Centra 8,400 r.p.m. for 10 min), resuspended in 300 ml 2xTY broth containing 100 µg ampicillin/ml and 25 µg kanamycin/ml (2xTY-AMP-KAN) and grown overnight, shaking at 37°C. Phage particles are purified and concentrated from the culture medium by two PEG-precipitations (Sambrook et al., 1990), resuspended in 2 ml PBS and passed through a 0.45 µm filter (Minisart NML; Sartorius) to give a final concentration of approximately 10¹³ transducing units/ml (ampicillin-resistant clones).

Panning of the Library. Immunotubes (Nunc) are coated overnight in PBS with 4 ml of either 100 µg/ml or 10 µg/ml of a polypeptide of the present invention. Tubes are blocked with 2% Marvel-PBS for 2 hours at 37°C and then washed 3 times in PBS. Approximately 10¹³ TU of phage is applied to the tube and incubated for 30 minutes at room temperature tumbling on an over and under turntable and then left to stand for another 1.5 hours. Tubes are washed 10 times with PBS 0.1% Tween-20 and 10 times with PBS. Phage are eluted by adding 1 ml of 100 mM triethylamine and rotating 15 minutes on an under and over turntable after which the solution is immediately neutralized with 0.5 ml of 1.0M Tris-HCl, pH 7.4. Phage are then used to infect 10 ml of mid-log E. coli TG1 by incubating eluted phage with bacteria for 30 minutes at 37°C. The E. coli are then plated on TYE plates containing 1%

glucose and 100 µg/ml ampicillin. The resulting bacterial library is then rescued with delta gene 3 helper phage as described above to prepare phage for a subsequent round of selection. This process is then repeated for a total of 4 rounds of affinity purification with tube-washing increased to 20 times with PBS, 0.1% Tween-20 and 20 times with PBS for rounds 3 and 4.

Characterization of Binders. Eluted phage from the 3rd and 4th rounds of selection are used to infect E. coli HB 2151 and soluble scFv is produced (Marks, et al., 1991) from single colonies for assay. ELISAs are performed with microtitre plates coated with either 10 pg/ml of the polypeptide of the present invention in 50 mM bicarbonate pH 9.6. Clones positive in ELISA are further characterized by PCR fingerprinting (see, e.g., PCT publication WO 92/01047) and then by sequencing. These ELISA positive clones may also be further characterized by techniques known in the art, such as, for example, epitope mapping, binding affinity, receptor signal transduction, ability to block or competitively inhibit antibody/antigen binding, and competitive agonistic or antagonistic activity.

Example 11: Method of Determining Alterations in a Gene Corresponding to a Polynucleotide

RNA isolated from entire families or individual patients presenting with a phenotype of interest (such as a disease) is be isolated. cDNA is then generated from these RNA samples using protocols known in the art. (See, Sambrook.) The cDNA is then used as a template for PCR, employing primers surrounding regions of interest in SEQ ID NO:X. Suggested PCR conditions consist of 35 cycles at 95 degrees C for 30 seconds; 60-120 seconds at 52-58 degrees C; and 60-120 seconds at 70 degrees C, using buffer solutions described in Sidransky et al., Science 252:706 (1991).

PCR products are then sequenced using primers labeled at their 5' end with T4 polynucleotide kinase, employing SequiTherm Polymerase. (Epicentre Technologies). The intron-exon borders of selected exons is also determined and genomic PCR products analyzed to confirm the results. PCR products harboring suspected mutations is then cloned and sequenced to validate the results of the direct sequencing.

PCR products is cloned into T-tailed vectors as described in Holton et al., Nucleic Acids Research, 19:1156 (1991) and sequenced with T7 polymerase (United States

Biochemical). . Affected individuals are identified by mutations not present in unaffected individuals.

Genomic rearrangements are also observed as a method of determining alterations in a gene corresponding to a polynucleotide. Genomic clones isolated according to Example 2
5 are nick-translated with digoxigenin deoxy-uridine 5'-triphosphate (Boehringer Mannheim), and FISH performed as described in Johnson et al., Methods Cell Biol. 35:73-99 (1991). Hybridization with the labeled probe is carried out using a vast excess of human cot-1 DNA for specific hybridization to the corresponding genomic locus.

Chromosomes are counterstained with 4,6-diamino-2-phenylidole and propidium
10 iodide, producing a combination of C- and R-bands. Aligned images for precise mapping are obtained using a triple-band filter set (Chroma Technology, Brattleboro, VT) in combination with a cooled charge-coupled device camera (Photometrics, Tucson, AZ) and variable excitation wavelength filters. (Johnson et al., Genet. Anal. Tech. Appl., 8:75 (1991).) Image collection, analysis and chromosomal fractional length measurements are performed using
15 the ISee Graphical Program System. (Inovision Corporation, Durham, NC.) Chromosome alterations of the genomic region hybridized by the probe are identified as insertions, deletions, and translocations. These alterations are used as a diagnostic marker for an associated disease.

20 ***Example 12: Method of Detecting Abnormal Levels of a Polypeptide in a Biological Sample***

A polypeptide of the present invention can be detected in a biological sample, and if an increased or decreased level of the polypeptide is detected, this polypeptide is a marker for
25 a particular phenotype. Methods of detection are numerous, and thus, it is understood that one skilled in the art can modify the following assay to fit their particular needs.

For example, antibody-sandwich ELISAs are used to detect polypeptides in a sample, preferably a biological sample. Wells of a microtiter plate are coated with specific antibodies, at a final concentration of 0.2 to 10 ug/ml. The antibodies are either monoclonal
30 or polyclonal and are produced by the method described in Example 10. The wells are blocked so that non-specific binding of the polypeptide to the well is reduced.

The coated wells are then incubated for > 2 hours at RT with a sample containing the polypeptide. Preferably, serial dilutions of the sample should be used to validate results. The plates are then washed three times with deionized or distilled water to remove unbounded polypeptide.

5 Next, 50 ul of specific antibody-alkaline phosphatase conjugate, at a concentration of 25-400 ng, is added and incubated for 2 hours at room temperature. The plates are again washed three times with deionized or distilled water to remove unbounded conjugate.

10 Add 75 ul of 4-methylumbelliferyl phosphate (MUP) or p-nitrophenyl phosphate (NPP) substrate solution to each well and incubate 1 hour at room temperature. Measure the reaction by a microtiter plate reader. Prepare a standard curve, using serial dilutions of a control sample, and plot polypeptide concentration on the X-axis (log scale) and fluorescence or absorbance of the Y-axis (linear scale). Interpolate the concentration of the polypeptide in the sample using the standard curve.

15 *Example 13: Formulation*

The invention also provides methods of treatment and/or prevention of diseases or disorders (such as, for example, any one or more of the diseases or disorders disclosed herein) by administration to a subject of an effective amount of a Therapeutic. By
20 therapeutic is meant a polynucleotides or polypeptides of the invention (including fragments and variants), agonists or antagonists thereof, and/or antibodies thereto, in combination with a pharmaceutically acceptable carrier type (e.g., a sterile carrier).

The Therapeutic will be formulated and dosed in a fashion consistent with good medical practice, taking into account the clinical condition of the individual patient (especially the
25 side effects of treatment with the Therapeutic alone), the site of delivery, the method of administration, the scheduling of administration, and other factors known to practitioners. The "effective amount" for purposes herein is thus determined by such considerations.

As a general proposition, the total pharmaceutically effective amount of the Therapeutic administered parenterally per dose will be in the range of about 1ug/kg/day to 10
30 mg/kg/day of patient body weight, although, as noted above, this will be subject to therapeutic discretion. More preferably, this dose is at least 0.01 mg/kg/day, and most preferably for humans between about 0.01 and 1 mg/kg/day for the hormone. If given

continuously, the Therapeutic is typically administered at a dose rate of about 1 ug/kg/hour to about 50 ug/kg/hour, either by 1-4 injections per day or by continuous subcutaneous infusions, for example, using a mini-pump. An intravenous bag solution may also be employed. The length of treatment needed to observe changes and the interval following treatment for responses to occur appears to vary depending on the desired effect.

Therapeutics can be administered orally, rectally, parenterally, intracistemally, intravaginally, intraperitoneally, topically (as by powders, ointments, gels, drops or transdermal patch), buccally, or as an oral or nasal spray. "Pharmaceutically acceptable carrier" refers to a non-toxic solid, semisolid or liquid filler, diluent, encapsulating material or formulation auxiliary of any. The term "parenteral" as used herein refers to modes of administration which include intravenous, intramuscular, intraperitoneal, intrasternal, subcutaneous and intraarticular injection and infusion.

Therapeutics of the invention are also suitably administered by sustained-release systems. Suitable examples of sustained-release Therapeutics are administered orally, rectally, parenterally, intracistemally, intravaginally, intraperitoneally, topically (as by powders, ointments, gels, drops or transdermal patch), buccally, or as an oral or nasal spray. "Pharmaceutically acceptable carrier" refers to a non-toxic solid, semisolid or liquid filler, diluent, encapsulating material or formulation auxiliary of any type. The term "parenteral" as used herein refers to modes of administration which include intravenous, intramuscular, intraperitoneal, intrasternal, subcutaneous and intraarticular injection and infusion.

Therapeutics of the invention are also suitably administered by sustained-release systems. Suitable examples of sustained-release Therapeutics include suitable polymeric materials (such as, for example, semi-permeable polymer matrices in the form of shaped articles, e.g., films, or microcapsules), suitable hydrophobic materials (for example as an emulsion in an acceptable oil) or ion exchange resins, and sparingly soluble derivatives (such as, for example, a sparingly soluble salt).

Sustained-release matrices include polylactides (U.S. Pat. No. 3,773,919, EP 58,481), copolymers of L-glutamic acid and gamma-ethyl-L-glutamate (Sidman et al., Biopolymers 22:547-556 (1983)), poly (2- hydroxyethyl methacrylate) (Langer et al., J. Biomed. Mater. Res. 15:167-277 (1981), and Langer, Chem. Tech. 12:98-105 (1982)), ethylene vinyl acetate (Langer et al., Id.) or poly-D- (-)-3-hydroxybutyric acid (EP 133,988).

Sustained-release Therapeutics also include liposomally entrapped Therapeutics of the invention (*see generally*, Langer, *Science* 249:1527-1533 (1990); Treat et al., in *Liposomes in the Therapy of Infectious Disease and Cancer*, Lopez-Berestein and Fidler (eds.), Liss, New York, pp. 317 -327 and 353-365 (1989)). Liposomes containing the
5 Therapeutic are prepared by methods known per se: DE 3,218,121; Epstein et al., Proc. Natl. Acad. Sci. (USA) 82:3688-3692 (1985); Hwang et al., Proc. Natl. Acad. Sci.(USA) 77:4030-4034 (1980); EP 52,322; EP 36,676; EP 88,046; EP 143,949; EP 142,641; Japanese Pat. Appl. 83-118008; U.S. Pat. Nos. 4,485,045 and 4,544,545; and EP 102,324. Ordinarily, the liposomes are of the small (about 200-800 Angstroms) unilamellar type in which the lipid
10 content is greater than about 30 mol. percent cholesterol, the selected proportion being adjusted for the optimal Therapeutic.

In yet an additional embodiment, the Therapeutics of the invention are delivered by way of a pump (*see* Langer, *supra*; Sefton, CRC Crit. Ref. Biomed. Eng. 14:201 (1987); Buchwald et al., Surgery 88:507 (1980); Saudek et al., N. Engl. J. Med. 321:574 (1989)).

15 Other controlled release systems are discussed in the review by Langer (*Science* 249:1527-1533 (1990)).

For parenteral administration, in one embodiment, the Therapeutic is formulated generally by mixing it at the desired degree of purity, in a unit dosage injectable form (solution, suspension, or emulsion), with a pharmaceutically acceptable carrier, i.e., one that
20 is non-toxic to recipients at the dosages and concentrations employed and is compatible with other ingredients of the formulation. For example, the formulation preferably does not include oxidizing agents and other compounds that are known to be deleterious to the Therapeutic.

Generally, the formulations are prepared by contacting the Therapeutic uniformly and
25 intimately with liquid carriers or finely divided solid carriers or both. Then, if necessary, the product is shaped into the desired formulation. Preferably the carrier is a parenteral carrier, more preferably a solution that is isotonic with the blood of the recipient. Examples of such carrier vehicles include water, saline, Ringer's solution, and dextrose solution. Non-aqueous vehicles such as fixed oils and ethyl oleate are also useful herein, as well as liposomes.

30 The carrier suitably contains minor amounts of additives such as substances that enhance isotonicity and chemical stability. Such materials are non-toxic to recipients at the dosages and concentrations employed, and include buffers such as phosphate, citrate,

succinate, acetic acid, and other organic acids or their salts; antioxidants such as ascorbic acid; low molecular weight (less than about ten residues) polypeptides, e.g., polyarginine or tripeptides; proteins, such as serum albumin, gelatin, or immunoglobulins; hydrophilic polymers such as polyvinylpyrrolidone; amino acids, such as glycine, glutamic acid, aspartic acid, or arginine; monosaccharides, disaccharides, and other carbohydrates including cellulose or its derivatives, glucose, manose, or dextrans; chelating agents such as EDTA; sugar alcohols such as mannitol or sorbitol; counterions such as sodium; and/or nonionic surfactants such as polysorbates, poloxamers, or PEG.

The Therapeutic is typically formulated in such vehicles at a concentration of about 0.1 mg/ml to 100 mg/ml, preferably 1-10 mg/ml, at a pH of about 3 to 8. It will be understood that the use of certain of the foregoing excipients, carriers, or stabilizers will result in the formation of polypeptide salts.

Any pharmaceutical used for therapeutic administration can be sterile. Sterility is readily accomplished by filtration through sterile filtration membranes (e.g., 0.2 micron membranes). Therapeutics generally are placed into a container having a sterile access port, for example, an intravenous solution bag or vial having a stopper pierceable by a hypodermic injection needle.

Therapeutics ordinarily will be stored in unit or multi-dose containers, for example, sealed ampoules or vials, as an aqueous solution or as a lyophilized formulation for reconstitution. As an example of a lyophilized formulation, 10-ml vials are filled with 5 ml of sterile-filtered 1% (w/v) aqueous Therapeutic solution, and the resulting mixture is lyophilized. The infusion solution is prepared by reconstituting the lyophilized Therapeutic using bacteriostatic Water-for-Injection.

The invention also provides a pharmaceutical pack or kit comprising one or more containers filled with one or more of the ingredients of the Therapeutics of the invention. Associated with such container(s) can be a notice in the form prescribed by a governmental agency regulating the manufacture, use or sale of pharmaceuticals or biological products, which notice reflects approval by the agency of manufacture, use or sale for human administration. In addition, the Therapeutics may be employed in conjunction with other therapeutic compounds.

The Therapeutics of the invention may be administered alone or in combination with adjuvants. Adjuvants that may be administered with the Therapeutics of the invention

include, but are not limited to, alum, alum plus deoxycholate (ImmunoAg), MTP-PE (Biocine Corp.), QS21 (Genentech, Inc.), BCG, and MPL. In a specific embodiment, Therapeutics of the invention are administered in combination with alum. In another specific embodiment, Therapeutics of the invention are administered in combination with QS-21.

5 Further adjuvants that may be administered with the Therapeutics of the invention include, but are not limited to, Monophosphoryl lipid immunomodulator, AdjuVax 100a, QS-21, QS-18, CRL1005, Aluminum salts, MF-59, and Virosomal adjuvant technology. Vaccines that may be administered with the Therapeutics of the invention include, but are not limited to, vaccines directed toward protection against MMR (measles, mumps, rubella), polio, varicella, tetanus/diphtheria, hepatitis A, hepatitis B, haemophilus influenzae B, whooping
10 cough, pneumonia, influenza, Lyme's Disease, rotavirus, cholera, yellow fever, Japanese encephalitis, poliomyelitis, rabies, typhoid fever, and pertussis. Combinations may be administered either concomitantly, e.g., as an admixture, separately but simultaneously or concurrently; or sequentially. This includes presentations in which the combined agents are administered together as a therapeutic mixture, and also procedures in which the combined
15 agents are administered separately but simultaneously, e.g., as through separate intravenous lines into the same individual. Administration "in combination" further includes the separate administration of one of the compounds or agents given first, followed by the second.

The Therapeutics of the invention may be administered alone or in combination with
20 other therapeutic agents. Therapeutic agents that may be administered in combination with the Therapeutics of the invention, include but not limited to, other members of the TNF family, chemotherapeutic agents, antibiotics, steroidal and non-steroidal anti-inflammatories, conventional immunotherapeutic agents, cytokines and/or growth factors. Combinations may be administered either concomitantly, e.g., as an admixture, separately but simultaneously or
25 concurrently; or sequentially. This includes presentations in which the combined agents are administered together as a therapeutic mixture, and also procedures in which the combined agents are administered separately but simultaneously, e.g., as through separate intravenous lines into the same individual. Administration "in combination" further includes the separate administration of one of the compounds or agents given first, followed by the second.

30 In one embodiment, the Therapeutics of the invention are administered in combination with members of the TNF family. TNF, TNF-related or TNF-like molecules that may be administered with the Therapeutics of the invention include, but are not limited

to, soluble forms of TNF-alpha, lymphotoxin- alpha (LT-alpha, also known as TNF-beta), LT-beta (found in complex heterotrimer LT-alpha2-beta), OPGL, FasL, CD27L, CD30L, CD40L, 4-1BBL, DcR3, OX40L, TNF-gamma (International Publication No. WO 96/14328), AIM-I (International Publication No. WO 97/33899), endokine-alpha (International Publication No. WO 98/07880), TR6 (International Publication No. WO 98/30694), OPG, and neutrokin-alpha (International Publication No. WO 98/18921, OX40, and nerve growth factor (NGF), and soluble forms of Fas, CD30, CD27, CD40 and 4-IBB, TR2 (International Publication No. WO 96/34095), DR3 (International Publication No. WO 97/33904), DR4 (International Publication No. WO 98/32856), TR5 (International Publication No. WO 98/30693), TR6 (International Publication No. WO 98/30694), TR7 (International Publication No. WO 98/41629), TRANK, TR9 (International Publication No. WO 98/56892), TR10 (International Publication No. WO 98/54202), 312C2 (International Publication No. WO 98/06842), and TR12, and soluble forms CD154, CD70, and CD153.

In certain embodiments, Therapeutics of the invention are administered in combination with antiretroviral agents, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and/or protease inhibitors. Nucleoside reverse transcriptase inhibitors that may be administered in combination with the Therapeutics of the invention, include, but are not limited to, RETROVIR™ (zidovudine/AZT), VIDEX™ (didanosine/ddI), HIVID™ (zalcitabine/ddC), ZERIT™ (stavudine/d4T), EPIVIR™ (lamivudine/3TC), and COMBIVIR™ (zidovudine/lamivudine). Non-nucleoside reverse transcriptase inhibitors that may be administered in combination with the Therapeutics of the invention, include, but are not limited to, VIRAMUNE™ (nevirapine), RESCRIPTOR™ (delavirdine), and SUSTIVA™ (efavirenz). Protease inhibitors that may be administered in combination with the Therapeutics of the invention, include, but are not limited to, CRIXIVAN™ (indinavir), NORVIR™ (ritonavir), INVIRASE™ (saquinavir), and VIRACEPT™ (nelfinavir). In a specific embodiment, antiretroviral agents, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and/or protease inhibitors may be used in any combination with Therapeutics of the invention to treat AIDS and/or to prevent or treat HIV infection.

In other embodiments, Therapeutics of the invention may be administered in combination with anti-opportunistic infection agents. Anti-opportunistic agents that may be administered in combination with the Therapeutics of the invention, include, but are not

limited to, TRIMETHOPRIM- SULFAMETHOXAZOLE™, DAPSONE™, PENTAMIDINE™, ATOVAQUONE™, ISONIAZID™, RIFAMPIN™, PYRAZINAMIDE™, ETHAMBUTOL™, RIFABUTIN™, CLARITHROMYCIN™, AZITHROMYCIN™, GANCICLOVIR™, FOSCARNET™, CIDOFOVIR™, FLUCONAZOLE™, ITRACONAZOLE™, KETOCONAZOLE™, ACYCLOVIR™, FAMCICOLVIR™, PYRIMETHAMINE™, LEUCOVORIN™, NEUPOGEN™ (filgrastim/G-CSF), and LEUKINE™ (sargramostim/GM-CSF). In a specific embodiment, Therapeutics of the invention are used in any combination with TRIMETHOPRIM-SULFAMETHOXAZOLE™, DAPSONE™, PENTAMIDINE™, and/or ATOVAQUONE™ to prophylactically treat or prevent an opportunistic *Pneumocystis carinii* pneumonia infection. In another specific embodiment, Therapeutics of the invention are used in any combination with ISONIAZID™, RIFAMPIN™, PYRAZINAMIDE™, and/or ETHAMBUTOL™ to prophylactically treat or prevent an opportunistic *Mycobacterium avium* complex infection. In another specific embodiment, Therapeutics of the invention are used in any combination with RIFABUTIN™, CLARITHROMYCIN™, and/or AZITHROMYCIN™ to prophylactically treat or prevent an opportunistic *Mycobacterium tuberculosis* infection. In another specific embodiment, Therapeutics of the invention are used in any combination with GANCICLOVIR™, FOSCARNET™, and/or CIDOFOVIR™ to prophylactically treat or prevent an opportunistic cytomegalovirus infection. In another specific embodiment, Therapeutics of the invention are used in any combination with FLUCONAZOLE™, ITRACONAZOLE™, and/or KETOCONAZOLE™ to prophylactically treat or prevent an opportunistic fungal infection. In another specific embodiment, Therapeutics of the invention are used in any combination with ACYCLOVIR™ and/or FAMCICOLVIR™ to prophylactically treat or prevent an opportunistic herpes simplex virus type I and/or type II infection. In another specific embodiment, Therapeutics of the invention are used in any combination with PYRIMETHAMINE™ and/or LEUCOVORIN™ to prophylactically treat or prevent an opportunistic *Toxoplasma gondii* infection. In another specific embodiment, Therapeutics of the invention are used in any combination with LEUCOVORIN™ and/or NEUPOGEN™ to prophylactically treat or prevent an opportunistic bacterial infection.

In a further embodiment, the Therapeutics of the invention are administered in combination with an antiviral agent. Antiviral agents that may be administered with the

Therapeutics of the invention include, but are not limited to, acyclovir, ribavirin, amantadine, and remantidine.

In a further embodiment, the Therapeutics of the invention are administered in combination with an antibiotic agent. Antibiotic agents that may be administered with the
5 Therapeutics of the invention include, but are not limited to, amoxicillin, beta-lactamases, aminoglycosides, beta-lactam (glycopeptide), beta-lactamases, Clindamycin, chloramphenicol, cephalosporins, ciprofloxacin, ciprofloxacin, erythromycin, fluoroquinolones, macrolides, metronidazole, penicillins, quinolones, rifampin, streptomycin, sulfonamide, tetracyclines, trimethoprim, trimethoprim-sulfamthoxazole, and vancomycin.

10 Conventional nonspecific immunosuppressive agents, that may be administered in combination with the Therapeutics of the invention include, but are not limited to, steroids, cyclosporine, cyclosporine analogs, cyclophosphamide methylprednisone, prednisone, azathioprine, FK-506, 15-deoxyspergualin, and other immunosuppressive agents that act by suppressing the function of responding T cells.

15 In specific embodiments, Therapeutics of the invention are administered in combination with immunosuppressants. Immunosuppressants preparations that may be administered with the Therapeutics of the invention include, but are not limited to, ORTHOCLONE™ (OKT3), SANDIMMUNE™/NEORAL™/SANGDYA™ (cyclosporin), PROGRAF™ (tacrolimus), CELLCEPT™ (mycophenolate), Azathioprine, glucocorticosteroids,
20 and RAPAMUNE™ (sirolimus). In a specific embodiment, immunosuppressants may be used to prevent rejection of organ or bone marrow transplantation.

In an additional embodiment, Therapeutics of the invention are administered alone or in combination with one or more intravenous immune globulin preparations. Intravenous immune globulin preparations that may be administered with the Therapeutics of the
25 invention include, but not limited to, GAMMAR™, IVEEGAM™, SANDOGLOBULIN™, GAMMAGARD S/D™, and GAMIMUNE™. In a specific embodiment, Therapeutics of the invention are administered in combination with intravenous immune globulin preparations in transplantation therapy (e.g., bone marrow transplant).

30 In an additional embodiment, the Therapeutics of the invention are administered alone or in combination with an anti-inflammatory agent. Anti-inflammatory agents that may be administered with the Therapeutics of the invention include, but are not limited to, glucocorticoids and the nonsteroidal anti-inflammatories, aminoarylcarboxylic acid

derivatives, arylacetic acid derivatives, arylbutyric acid derivatives, arylcarboxylic acids, arylpropionic acid derivatives, pyrazoles, pyrazolones, salicylic acid derivatives, thiazinecarboxamides, e-acetamidocaproic acid, S-adenosylmethionine, 3-amino-4-hydroxybutyric acid, amixetrine, bendazac, benzydamine, bucolome, difenpiramide, ditazol, emorfazone, guaiazulene, nabumetone, nimesulide, orgotein, oxaceprol, paranyline, perisoxal, pifoxime, proquazone, proxazole, and tenidap.

In another embodiment, compositions of the invention are administered in combination with a chemotherapeutic agent. Chemotherapeutic agents that may be administered with the Therapeutics of the invention include, but are not limited to, antibiotic derivatives (e.g., doxorubicin, bleomycin, daunorubicin, and dactinomycin); antiestrogens (e.g., tamoxifen); antimetabolites (e.g., fluorouracil, 5-FU, methotrexate, floxuridine, interferon alpha-2b, glutamic acid, plicamycin, mercaptopurine, and 6-thioguanine); cytotoxic agents (e.g., carmustine, BCNU, lomustine, CCNU, cytosine arabinoside, cyclophosphamide, estramustine, hydroxyurea, procarbazine, mitomycin, busulfan, cis-platin, and vincristine sulfate); hormones (e.g., medroxyprogesterone, estramustine phosphate sodium, ethinyl estradiol, estradiol, megestrol acetate, methyltestosterone, diethylstilbestrol diphosphate, chlorotrianisene, and testolactone); nitrogen mustard derivatives (e.g., mephallen, chorambucil, mechlorethamine (nitrogen mustard) and thiotepa); steroids and combinations (e.g., bethamethasone sodium phosphate); and others (e.g., dicarbazine, asparaginase, mitotane, vincristine sulfate, vinblastine sulfate, and etoposide).

In a specific embodiment, Therapeutics of the invention are administered in combination with CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone) or any combination of the components of CHOP. In another embodiment, Therapeutics of the invention are administered in combination with Rituximab. In a further embodiment, Therapeutics of the invention are administered with Rituxmab and CHOP, or Rituxmab and any combination of the components of CHOP.

In an additional embodiment, the Therapeutics of the invention are administered in combination with cytokines. Cytokines that may be administered with the Therapeutics of the invention include, but are not limited to, IL2, IL3, IL4, IL5, IL6, IL7, IL10, IL12, IL13, IL15, anti-CD40, CD40L, IFN-gamma and TNF-alpha. In another embodiment, Therapeutics of the invention may be administered with any interleukin, including, but not

limited to, IL-1alpha, IL-1beta, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-11, IL-12, IL-13, IL-14, IL-15, IL-16, IL-17, IL-18, IL-19, IL-20, and IL-21.

In an additional embodiment, the Therapeutics of the invention are administered in combination with angiogenic proteins. Angiogenic proteins that may be administered with the Therapeutics of the invention include, but are not limited to, Glioma Derived Growth Factor (GDGF), as disclosed in European Patent Number EP-399816; Platelet Derived Growth Factor-A (PDGF-A), as disclosed in European Patent Number EP-682110; Platelet Derived Growth Factor-B (PDGF-B), as disclosed in European Patent Number EP-282317; Placental Growth Factor (PlGF), as disclosed in International Publication Number WO 92/06194; Placental Growth Factor-2 (PlGF-2), as disclosed in Hauser et al., Growth Factors, 4:259-268 (1993); Vascular Endothelial Growth Factor (VEGF), as disclosed in International Publication Number WO 90/13649; Vascular Endothelial Growth Factor-A (VEGF-A), as disclosed in European Patent Number EP-506477; Vascular Endothelial Growth Factor-2 (VEGF-2), as disclosed in International Publication Number WO 96/39515; Vascular Endothelial Growth Factor B (VEGF-3); Vascular Endothelial Growth Factor B-186 (VEGF-B186), as disclosed in International Publication Number WO 96/26736; Vascular Endothelial Growth Factor-D (VEGF-D), as disclosed in International Publication Number WO 98/02543; Vascular Endothelial Growth Factor-D (VEGF-D), as disclosed in International Publication Number WO 98/07832; and Vascular Endothelial Growth Factor-E (VEGF-E), as disclosed in German Patent Number DE19639601. The above mentioned references are incorporated herein by reference herein.

In an additional embodiment, the Therapeutics of the invention are administered in combination with hematopoietic growth factors. Hematopoietic growth factors that may be administered with the Therapeutics of the invention include, but are not limited to, LEUKINE™ (SARGRAMOSTIM™) and NEUPOGEN™ (FILGRASTIM™).

In an additional embodiment, the Therapeutics of the invention are administered in combination with Fibroblast Growth Factors. Fibroblast Growth Factors that may be administered with the Therapeutics of the invention include, but are not limited to, FGF-1, FGF-2, FGF-3, FGF-4, FGF-5, FGF-6, FGF-7, FGF-8, FGF-9, FGF-10, FGF-11, FGF-12, FGF-13, FGF-14, and FGF-15.

In additional embodiments, the Therapeutics of the invention are administered in combination with other therapeutic or prophylactic regimens, such as, for example, radiation therapy.

Example 14: Method of Treating Decreased Levels of the Polypeptide

The present invention relates to a method for treating an individual in need of an increased level of a polypeptide of the invention in the body comprising administering to such an individual a composition comprising a therapeutically effective amount of an agonist of the invention (including polypeptides of the invention). Moreover, it will be appreciated that conditions caused by a decrease in the standard or normal expression level of a colon or colon cancer related polypeptide in an individual can be treated by administering the agonist or antagonist of the present invention. Thus, the invention also provides a method of treatment of an individual in need of an increased level of the polypeptide comprising administering to such an individual a Therapeutic comprising an amount of the agonist or antagonist to increase the activity level of the polypeptide in such an individual.

For example, a patient with decreased levels of a polypeptide receives a daily dose 0.1-100 ug/kg of the agonist or antagonist for six consecutive days. The exact details of the dosing scheme, based on administration and formulation, are provided in Example 13.

Example 15: Method of Treating Increased Levels of the Polypeptide

The present invention also relates to a method of treating an individual in need of a decreased level of a polypeptide of the invention in the body comprising administering to such an individual a composition comprising a therapeutically effective amount of an antagonist of the invention (including polypeptides and antibodies of the invention).

In one example, antisense technology is used to inhibit production of a polypeptide of the present invention. This technology is one example of a method of decreasing levels of a polypeptide, due to a variety of etiologies, such as cancer.

For example, a patient diagnosed with abnormally increased levels of a polypeptide is administered intravenously antisense polynucleotides at 0.5, 1.0, 1.5, 2.0 and 3.0 mg/kg day

for 21 days. This treatment is repeated after a 7-day rest period if the treatment was well tolerated. The formulation of the antisense polynucleotide is provided in Example 13.

Example 16: Method of Treatment Using Gene Therapy-Ex Vivo

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One method of gene therapy transplants fibroblasts, which are capable of expressing a polypeptide, onto a patient. Generally, fibroblasts are obtained from a subject by skin biopsy. The resulting tissue is placed in tissue-culture medium and separated into small pieces. Small chunks of the tissue are placed on a wet surface of a tissue culture flask, approximately
10 ten pieces are placed in each flask. The flask is turned upside down, closed tight and left at room temperature over night. After 24 hours at room temperature, the flask is inverted and the chunks of tissue remain fixed to the bottom of the flask and fresh media (e.g., Ham's F12 media, with 10% FBS, penicillin and streptomycin) is added. The flasks are then incubated at 37 degree C for approximately one week.

15

At this time, fresh media is added and subsequently changed every several days. After an additional two weeks in culture, a monolayer of fibroblasts emerge. The monolayer is trypsinized and scaled into larger flasks.

20

pMV-7 (Kirschmeier, P.T. et al., DNA, 7:219-25 (1988)), flanked by the long terminal repeats of the Moloney murine sarcoma virus, is digested with EcoRI and HindIII and subsequently treated with calf intestinal phosphatase. The linear vector is fractionated on agarose gel and purified, using glass beads.

25

The cDNA encoding a polypeptide of the present invention can be amplified using PCR primers which correspond to the 5' and 3' end sequences respectively as set forth in Example 1 using primers and having appropriate restriction sites and initiation/stop codons, if
25 necessary. Preferably, the 5' primer contains an EcoRI site and the 3' primer includes a HindIII site. Equal quantities of the Moloney murine sarcoma virus linear backbone and the amplified EcoRI and HindIII fragment are added together, in the presence of T4 DNA ligase. The resulting mixture is maintained under conditions appropriate for ligation of the two fragments. The ligation mixture is then used to transform bacteria HB101, which are then
30 plated onto agar containing kanamycin for the purpose of confirming that the vector has the gene of interest properly inserted.

2090

The amphotropic pA317 or GP+am12 packaging cells are grown in tissue culture to confluent density in Dulbecco's Modified Eagles Medium (DMEM) with 10% calf serum (CS), penicillin and streptomycin. The MSV vector containing the gene is then added to the media and the packaging cells transduced with the vector. The packaging cells now produce
5 infectious viral particles containing the gene (the packaging cells are now referred to as producer cells).

Fresh media is added to the transduced producer cells, and subsequently, the media is harvested from a 10 cm plate of confluent producer cells. The spent media, containing the infectious viral particles, is filtered through a millipore filter to remove detached producer
10 cells and this media is then used to infect fibroblast cells. Media is removed from a sub-confluent plate of fibroblasts and quickly replaced with the media from the producer cells. This media is removed and replaced with fresh media. If the titer of virus is high, then virtually all fibroblasts will be infected and no selection is required. If the titer is very low, then it is necessary to use a retroviral vector that has a selectable marker, such as neo or his.
15 Once the fibroblasts have been efficiently infected, the fibroblasts are analyzed to determine whether protein is produced.

The engineered fibroblasts are then transplanted onto the host, either alone or after having been grown to confluence on cytodex 3 microcarrier beads.

Example 17: Gene Therapy Using Endogenous Genes Corresponding To Polynucleotides of the Invention

Another method of gene therapy according to the present invention involves operably associating the endogenous polynucleotide sequence of the invention with a promoter via
25 homologous recombination as described, for example, in U.S. Patent NO: 5,641,670, issued June 24, 1997; International Publication NO: WO 96/29411, published September 26, 1996; International Publication NO: WO 94/12650, published August 4, 1994; Koller et al., *Proc. Natl. Acad. Sci. USA*, 86:8932-8935 (1989); and Zijlstra et al., *Nature*, 342:435-438 (1989). This method involves the activation of a gene which is present in the target cells, but which is
30 not expressed in the cells, or is expressed at a lower level than desired.

Polynucleotide constructs are made which contain a promoter and targeting sequences, which are homologous to the 5' non-coding sequence of endogenous

polynucleotide sequence, flanking the promoter. The targeting sequence will be sufficiently near the 5' end of the polynucleotide sequence so the promoter will be operably linked to the endogenous sequence upon homologous recombination. The promoter and the targeting sequences can be amplified using PCR. Preferably, the amplified promoter contains
5 distinct restriction enzyme sites on the 5' and 3' ends. Preferably, the 3' end of the first targeting sequence contains the same restriction enzyme site as the 5' end of the amplified promoter and the 5' end of the second targeting sequence contains the same restriction site as the 3' end of the amplified promoter.

The amplified promoter and the amplified targeting sequences are digested with the
10 appropriate restriction enzymes and subsequently treated with calf intestinal phosphatase. The digested promoter and digested targeting sequences are added together in the presence of T4 DNA ligase. The resulting mixture is maintained under conditions appropriate for ligation of the two fragments. The construct is size fractionated on an agarose gel then purified by phenol extraction and ethanol precipitation.

15 In this Example, the polynucleotide constructs are administered as naked polynucleotides via electroporation. However, the polynucleotide constructs may also be administered with transfection-facilitating agents, such as liposomes, viral sequences, viral particles, precipitating agents, etc. Such methods of delivery are known in the art.

Once the cells are transfected, homologous recombination will take place which
20 results in the promoter being operably linked to the endogenous polynucleotide sequence. This results in the expression of polynucleotide corresponding to the polynucleotide in the cell. Expression may be detected by immunological staining, or any other method known in the art.

Fibroblasts are obtained from a subject by skin biopsy. The resulting tissue is placed
25 in DMEM + 10% fetal calf serum. Exponentially growing or early stationary phase fibroblasts are trypsinized and rinsed from the plastic surface with nutrient medium. An aliquot of the cell suspension is removed for counting, and the remaining cells are subjected to centrifugation. The supernatant is aspirated and the pellet is resuspended in 5 ml of electroporation buffer (20 mM HEPES pH 7.3, 137 mM NaCl, 5 mM KCl, 0.7 mM Na₂
30 HPO₄, 6 mM dextrose). The cells are recentrifuged, the supernatant aspirated, and the cells resuspended in electroporation buffer containing 1 mg/ml acetylated bovine serum albumin.

The final cell suspension contains approximately 3×10^6 cells/ml. Electroporation should be performed immediately following resuspension.

Plasmid DNA is prepared according to standard techniques. For example, to construct a plasmid for targeting to the locus corresponding to the polynucleotide of the invention, plasmid pUC18 (MBI Fermentas, Amherst, NY) is digested with HindIII. The CMV promoter is amplified by PCR with an XbaI site on the 5' end and a BamHI site on the 3' end. Two non-coding sequences are amplified via PCR: one non-coding sequence (fragment 1) is amplified with a HindIII site at the 5' end and an Xba site at the 3' end; the other non-coding sequence (fragment 2) is amplified with a BamHI site at the 5' end and a HindIII site at the 3' end. The CMV promoter and the fragments (1 and 2) are digested with the appropriate enzymes (CMV promoter - XbaI and BamHI; fragment 1 - XbaI; fragment 2 - BamHI) and ligated together. The resulting ligation product is digested with HindIII, and ligated with the HindIII-digested pUC18 plasmid.

Plasmid DNA is added to a sterile cuvette with a 0.4 cm electrode gap (Bio-Rad). The final DNA concentration is generally at least 120 $\mu\text{g/ml}$. 0.5 ml of the cell suspension (containing approximately 1.5×10^6 cells) is then added to the cuvette, and the cell suspension and DNA solutions are gently mixed. Electroporation is performed with a Gene-Pulser apparatus (Bio-Rad). Capacitance and voltage are set at 960 μF and 250-300 V, respectively. As voltage increases, cell survival decreases, but the percentage of surviving cells that stably incorporate the introduced DNA into their genome increases dramatically. Given these parameters, a pulse time of approximately 14-20 mSec should be observed.

Electroporated cells are maintained at room temperature for approximately 5 min, and the contents of the cuvette are then gently removed with a sterile transfer pipette. The cells are added directly to 10 ml of prewarmed nutrient media (DMEM with 15% calf serum) in a 10 cm dish and incubated at 37 degree C. The following day, the media is aspirated and replaced with 10 ml of fresh media and incubated for a further 16-24 hours.

The engineered fibroblasts are then injected into the host, either alone or after having been grown to confluence on cytodex 3 microcarrier beads. The fibroblasts now produce the protein product. The fibroblasts can then be introduced into a patient as described above.

Example 18: Method of Treatment Using Gene Therapy - In Vivo

Another aspect of the present invention is using *in vivo* gene therapy methods to treat disorders, diseases and conditions. The gene therapy method relates to the introduction of naked nucleic acid (DNA, RNA, and antisense DNA or RNA) sequences into an animal to increase or decrease the expression of the polypeptide. The polynucleotide of the present invention may be operatively linked to a promoter or any other genetic elements necessary for the expression of the polypeptide by the target tissue. Such gene therapy and delivery techniques and methods are known in the art, see, for example, WO90/11092, WO98/11779; U.S. Patent NO. 5693622, 5705151, 5580859; Tabata et al., Cardiovasc. Res. 35(3):470-479 (1997); Chao et al., Pharmacol. Res. 35(6):517-522 (1997); Wolff, Neuromuscul. Disord. 7(5):314-318 (1997); Schwartz et al., Gene Ther. 3(5):405-411 (1996); Tsurumi et al., Circulation 94(12):3281-3290 (1996) (incorporated herein by reference).

The polynucleotide constructs may be delivered by any method that delivers injectable materials to the cells of an animal, such as, injection into the interstitial space of tissues (heart, muscle, skin, lung, liver, intestine and the like). The polynucleotide constructs can be delivered in a pharmaceutically acceptable liquid or aqueous carrier.

The term "naked" polynucleotide, DNA or RNA, refers to sequences that are free from any delivery vehicle that acts to assist, promote, or facilitate entry into the cell, including viral sequences, viral particles, liposome formulations, lipofectin or precipitating agents and the like. However, the polynucleotides of the present invention may also be delivered in liposome formulations (such as those taught in Felgner P.L. et al. (1995) Ann. NY Acad. Sci. 772:126-139 and Abdallah B. et al. (1995) Biol. Cell 85(1):1-7) which can be prepared by methods well known to those skilled in the art.

The polynucleotide vector constructs used in the gene therapy method are preferably constructs that will not integrate into the host genome nor will they contain sequences that allow for replication. Any strong promoter known to those skilled in the art can be used for driving the expression of DNA. Unlike other gene therapies techniques, one major advantage of introducing naked nucleic acid sequences into target cells is the transitory nature of the polynucleotide synthesis in the cells. Studies have shown that non-replicating DNA sequences can be introduced into cells to provide production of the desired polypeptide for periods of up to six months.

The polynucleotide construct can be delivered to the interstitial space of tissues within the an animal, including of muscle, skin, brain, lung, liver, spleen, bone marrow, thymus,

heart, lymph, blood, bone, cartilage, pancreas, kidney, gall bladder, stomach, intestine, testis, ovary, uterus, rectum, nervous system, eye, gland, and connective tissue. Interstitial space of the tissues comprises the intercellular fluid, mucopolysaccharide matrix among the reticular fibers of organ tissues, elastic fibers in the walls of vessels or chambers, collagen fibers of fibrous tissues, or that same matrix within connective tissue ensheathing muscle cells or in the lacunae of bone. It is similarly the space occupied by the plasma of the circulation and the lymph fluid of the lymphatic channels. Delivery to the interstitial space of muscle tissue is preferred for the reasons discussed below. They may be conveniently delivered by injection into the tissues comprising these cells. They are preferably delivered to and expressed in persistent, non-dividing cells which are differentiated, although delivery and expression may be achieved in non-differentiated or less completely differentiated cells, such as, for example, stem cells of blood or skin fibroblasts. *In vivo* muscle cells are particularly competent in their ability to take up and express polynucleotides.

For the naked polynucleotide injection, an effective dosage amount of DNA or RNA will be in the range of from about 0.05 g/kg body weight to about 50 mg/kg body weight. Preferably the dosage will be from about 0.005 mg/kg to about 20 mg/kg and more preferably from about 0.05 mg/kg to about 5 mg/kg. Of course, as the artisan of ordinary skill will appreciate, this dosage will vary according to the tissue site of injection. The appropriate and effective dosage of nucleic acid sequence can readily be determined by those of ordinary skill in the art and may depend on the condition being treated and the route of administration. The preferred route of administration is by the parenteral route of injection into the interstitial space of tissues. However, other parenteral routes may also be used, such as, inhalation of an aerosol formulation particularly for delivery to lungs or bronchial tissues, throat or mucous membranes of the nose. In addition, naked polynucleotide constructs can be delivered to arteries during angioplasty by the catheter used in the procedure.

The dose response effects of injected polynucleotide in muscle *in vivo* is determined as follows. Suitable template DNA for production of mRNA coding for polypeptide of the present invention is prepared in accordance with a standard recombinant DNA methodology. The template DNA, which may be either circular or linear, is either used as naked DNA or complexed with liposomes. The quadriceps muscles of mice are then injected with various amounts of the template DNA.

Five to six week old female and male Balb/C mice are anesthetized by intraperitoneal

injection with 0.3 ml of 2.5% Avertin. A 1.5 cm incision is made on the anterior thigh, and the quadriceps muscle is directly visualized. The template DNA is injected in 0.1 ml of carrier in a 1 cc syringe through a 27 gauge needle over one minute, approximately 0.5 cm from the distal insertion site of the muscle into the knee and about 0.2 cm deep. A suture is placed over the injection site for future localization, and the skin is closed with stainless steel clips.

After an appropriate incubation time (e.g., 7 days) muscle extracts are prepared by excising the entire quadriceps. Every fifth 15 um cross-section of the individual quadriceps muscles is histochemically stained for protein expression. A time course for protein expression may be done in a similar fashion except that quadriceps from different mice are harvested at different times. Persistence of DNA in muscle following injection may be determined by Southern blot analysis after preparing total cellular DNA and HIRT supernatants from injected and control mice. The results of the above experimentation in mice can be use to extrapolate proper dosages and other treatment parameters in humans and other animals using naked DNA.

Example 19: Transgenic Animals

The polypeptides of the invention can also be expressed in transgenic animals. Animals of any species, including, but not limited to, mice, rats, rabbits, hamsters, guinea pigs, pigs, micro-pigs, goats, sheep, cows and non-human primates, e.g., baboons, monkeys, and chimpanzees may be used to generate transgenic animals. In a specific embodiment, techniques described herein or otherwise known in the art, are used to express polypeptides of the invention in humans, as part of a gene therapy protocol.

Any technique known in the art may be used to introduce the transgene (i.e., polynucleotides of the invention) into animals to produce the founder lines of transgenic animals. Such techniques include, but are not limited to, pronuclear microinjection (Paterson et al., Appl. Microbiol. Biotechnol. 40:691-698 (1994); Carver et al., Biotechnology (NY) 11:1263-1270 (1993); Wright et al., Biotechnology (NY) 9:830-834 (1991); and Hoppe et al., U.S. Pat. No. 4,873,191 (1989)); retrovirus mediated gene transfer into germ lines (Van der Putten et al., Proc. Natl. Acad. Sci., USA 82:6148-6152 (1985)), blastocysts or embryos; gene targeting in embryonic stem cells (Thompson et al., Cell 56:313-321 (1989));

electroporation of cells or embryos (Lo, 1983, Mol Cell Biol. 3:1803-1814 (1983)); introduction of the polynucleotides of the invention using a gene gun (see, e.g., Ulmer et al., Science 259:1745 (1993); introducing nucleic acid constructs into embryonic pluripotent stem cells and transferring the stem cells back into the blastocyst; and sperm-mediated gene transfer (Lavitrano et al., Cell 57:717-723 (1989); etc. For a review of such techniques, see 5 Gordon, "Transgenic Animals," Intl. Rev. Cytol. 115:171-229 (1989), which is incorporated by reference herein in its entirety.

Any technique known in the art may be used to produce transgenic clones containing polynucleotides of the invention, for example, nuclear transfer into enucleated oocytes of 10 nuclei from cultured embryonic, fetal, or adult cells induced to quiescence (Campell et al., Nature 380:64-66 (1996); Wilmut et al., Nature 385:810-813 (1997)).

The present invention provides for transgenic animals that carry the transgene in all their cells, as well as animals which carry the transgene in some, but not all their cells, *i.e.*, mosaic animals or chimeric. The transgene may be integrated as a single transgene or as 15 multiple copies such as in concatamers, *e.g.*, head-to-head tandems or head-to-tail tandems. The transgene may also be selectively introduced into and activated in a particular cell type by following, for example, the teaching of Lasko et al. (Lasko et al., Proc. Natl. Acad. Sci. USA 89:6232-6236 (1992)). The regulatory sequences required for such a cell-type specific activation will depend upon the particular cell type of interest, and will be apparent to those 20 of skill in the art. When it is desired that the polynucleotide transgene be integrated into the chromosomal site of the endogenous gene, gene targeting is preferred. Briefly, when such a technique is to be utilized, vectors containing some nucleotide sequences homologous to the endogenous gene are designed for the purpose of integrating, via homologous recombination with chromosomal sequences, into and disrupting the function of the nucleotide sequence of 25 the endogenous gene. The transgene may also be selectively introduced into a particular cell type, thus inactivating the endogenous gene in only that cell type, by following, for example, the teaching of Gu et al. (Gu et al., Science 265:103-106 (1994)). The regulatory sequences required for such a cell-type specific inactivation will depend upon the particular cell type of interest, and will be apparent to those of skill in the art.

30 Once transgenic animals have been generated, the expression of the recombinant gene may be assayed utilizing standard techniques. Initial screening may be accomplished by Southern blot analysis or PCR techniques to analyze animal tissues to verify that integration

of the transgene has taken place. The level of mRNA expression of the transgene in the tissues of the transgenic animals may also be assessed using techniques which include, but are not limited to, Northern blot analysis of tissue samples obtained from the animal, *in situ* hybridization analysis, and reverse transcriptase-PCR (rt-PCR). Samples of transgenic gene-expressing tissue may also be evaluated immunocytochemically or immunohistochemically using antibodies specific for the transgene product.

Once the founder animals are produced, they may be bred, inbred, outbred, or crossbred to produce colonies of the particular animal. Examples of such breeding strategies include, but are not limited to: outbreeding of founder animals with more than one integration site in order to establish separate lines; inbreeding of separate lines in order to produce compound transgenics that express the transgene at higher levels because of the effects of additive expression of each transgene; crossing of heterozygous transgenic animals to produce animals homozygous for a given integration site in order to both augment expression and eliminate the need for screening of animals by DNA analysis; crossing of separate homozygous lines to produce compound heterozygous or homozygous lines; and breeding to place the transgene on a distinct background that is appropriate for an experimental model of interest.

Transgenic animals of the invention have uses which include, but are not limited to, animal model systems useful in elaborating the biological function of polypeptides of the present invention, studying conditions and/or disorders associated with aberrant expression, and in screening for compounds effective in ameliorating such conditions and/or disorders.

Example 20: Knock-Out Animals

Endogenous gene expression can also be reduced by inactivating or "knocking out" the gene and/or its promoter using targeted homologous recombination. (*E.g.*, see Smithies et al., *Nature* 317:230-234 (1985); Thomas & Capecchi, *Cell* 51:503-512 (1987); Thompson et al., *Cell* 5:313-321 (1989); each of which is incorporated by reference herein in its entirety). For example, a mutant, non-functional polynucleotide of the invention (or a completely unrelated DNA sequence) flanked by DNA homologous to the endogenous polynucleotide sequence (either the coding regions or regulatory regions of the gene) can be used, with or without a selectable marker and/or a negative selectable marker, to transfect

cells that express polypeptides of the invention *in vivo*. In another embodiment, techniques known in the art are used to generate knockouts in cells that contain, but do not express the gene of interest. Insertion of the DNA construct, via targeted homologous recombination, results in inactivation of the targeted gene. Such approaches are particularly suited in research and agricultural fields where modifications to embryonic stem cells can be used to generate animal offspring with an inactive targeted gene (*e.g.*, see Thomas & Capecchi 1987 and Thompson 1989, *supra*). However this approach can be routinely adapted for use in humans provided the recombinant DNA constructs are directly administered or targeted to the required site *in vivo* using appropriate viral vectors that will be apparent to those of skill in the art.

In further embodiments of the invention, cells that are genetically engineered to express the polypeptides of the invention, or alternatively, that are genetically engineered not to express the polypeptides of the invention (*e.g.*, knockouts) are administered to a patient *in vivo*. Such cells may be obtained from the patient (*i.e.*, animal, including human) or an MHC compatible donor and can include, but are not limited to fibroblasts, bone marrow cells, blood cells (*e.g.*, lymphocytes), adipocytes, muscle cells, endothelial cells etc. The cells are genetically engineered *in vitro* using recombinant DNA techniques to introduce the coding sequence of polypeptides of the invention into the cells, or alternatively, to disrupt the coding sequence and/or endogenous regulatory sequence associated with the polypeptides of the invention, *e.g.*, by transduction (using viral vectors, and preferably vectors that integrate the transgene into the cell genome) or transfection procedures, including, but not limited to, the use of plasmids, cosmids, YACs, naked DNA, electroporation, liposomes, etc. The coding sequence of the polypeptides of the invention can be placed under the control of a strong constitutive or inducible promoter or promoter/enhancer to achieve expression, and preferably secretion, of the polypeptides of the invention. The engineered cells which express and preferably secrete the polypeptides of the invention can be introduced into the patient systemically, *e.g.*, in the circulation, or intraperitoneally.

Alternatively, the cells can be incorporated into a matrix and implanted in the body, *e.g.*, genetically engineered fibroblasts can be implanted as part of a skin graft; genetically engineered endothelial cells can be implanted as part of a lymphatic or vascular graft. (See, for example, Anderson et al. U.S. Patent No. 5,399,349; and Mulligan & Wilson, U.S. Patent No. 5,460,959 each of which is incorporated by reference herein in its entirety).

When the cells to be administered are non-autologous or non-MHC compatible cells, they can be administered using well known techniques which prevent the development of a host immune response against the introduced cells. For example, the cells may be introduced in an encapsulated form which, while allowing for an exchange of components with the immediate extracellular environment, does not allow the introduced cells to be recognized by the host immune system.

Transgenic and "knock-out" animals of the invention have uses which include, but are not limited to, animal model systems useful in elaborating the biological function of polypeptides of the present invention, studying conditions and/or disorders associated with aberrant expression, and in screening for compounds effective in ameliorating such conditions and/or disorders.

Example 21: Assays Detecting Stimulation or Inhibition of B cell Proliferation and Differentiation

Generation of functional humoral immune responses requires both soluble and cognate signaling between B-lineage cells and their microenvironment. Signals may impart a positive stimulus that allows a B-lineage cell to continue its programmed development, or a negative stimulus that instructs the cell to arrest its current developmental pathway. To date, numerous stimulatory and inhibitory signals have been found to influence B cell responsiveness including IL-2, IL-4, IL-5, IL-6, IL-7, IL10, IL-13, IL-14 and IL-15. Interestingly, these signals are by themselves weak effectors but can, in combination with various co-stimulatory proteins, induce activation, proliferation, differentiation, homing, tolerance and death among B cell populations.

One of the best studied classes of B-cell co-stimulatory proteins is the TNF-superfamily. Within this family CD40, CD27, and CD30 along with their respective ligands CD154, CD70, and CD153 have been found to regulate a variety of immune responses. Assays which allow for the detection and/or observation of the proliferation and differentiation of these B-cell populations and their precursors are valuable tools in determining the effects various proteins may have on these B-cell populations in terms of proliferation and differentiation. Listed below are two assays designed to allow for the

detection of the differentiation, proliferation, or inhibition of B-cell populations and their precursors.

In Vitro Assay- Agonists or antagonists of the invention can be assessed for its ability to induce activation, proliferation, differentiation or inhibition and/or death in B-cell populations and their precursors. The activity of the agonists or antagonists of the invention on purified human tonsillar B cells, measured qualitatively over the dose range from 0.1 to 10,000 ng/mL, is assessed in a standard B-lymphocyte co-stimulation assay in which purified tonsillar B cells are cultured in the presence of either formalin-fixed *Staphylococcus aureus* Cowan I (SAC) or immobilized anti-human IgM antibody as the priming agent. Second signals such as IL-2 and IL-15 synergize with SAC and IgM crosslinking to elicit B cell proliferation as measured by tritiated-thymidine incorporation. Novel synergizing agents can be readily identified using this assay. The assay involves isolating human tonsillar B cells by magnetic bead (MACS) depletion of CD3-positive cells. The resulting cell population is greater than 95% B cells as assessed by expression of CD45R(B220).

Various dilutions of each sample are placed into individual wells of a 96-well plate to which are added 10^5 B-cells suspended in culture medium (RPMI 1640 containing 10% FBS, 5×10^{-5} M 2ME, 100U/ml penicillin, 10ug/ml streptomycin, and 10^{-5} dilution of SAC) in a total volume of 150ul. Proliferation or inhibition is quantitated by a 20h pulse (1uCi/well) with 3 H-thymidine (6.7 Ci/mM) beginning 72h post factor addition. The positive and negative controls are IL2 and medium respectively.

In Vivo Assay- BALB/c mice are injected (i.p.) twice per day with buffer only, or 2 mg/Kg of agonists or antagonists of the invention, or truncated forms thereof. Mice receive this treatment for 4 consecutive days, at which time they are sacrificed and various tissues and serum collected for analyses. Comparison of H&E sections from normal spleens and spleens treated with agonists or antagonists of the invention identify the results of the activity of the agonists or antagonists on spleen cells, such as the diffusion of peri-arterial lymphatic sheaths, and/or significant increases in the nucleated cellularity of the red pulp regions, which may indicate the activation of the differentiation and proliferation of B-cell populations. Immunohistochemical studies using a B cell marker, anti-CD45R(B220), are used to determine whether any physiological changes to splenic cells, such as splenic disorganization, are due to increased B-cell representation within loosely defined B-cell zones that infiltrate established T-cell regions.

Flow cytometric analyses of the spleens from mice treated with agonist or antagonist is used to indicate whether the agonists or antagonists specifically increases the proportion of ThB+, CD45R(B220)dull B cells over that which is observed in control mice.

Likewise, a predicted consequence of increased mature B-cell representation in vivo is a relative increase in serum Ig titers. Accordingly, serum IgM and IgA levels are compared between buffer and agonists or antagonists-treated mice.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 22: T Cell Proliferation Assay

A CD3-induced proliferation assay is performed on PBMCs and is measured by the uptake of ^3H -thymidine. The assay is performed as follows. Ninety-six well plates are coated with 100 μl /well of mAb to CD3 (HIT3a, Pharmingen) or isotype-matched control mAb (B33.1) overnight at 4 degrees C (1 $\mu\text{g}/\text{ml}$ in .05M bicarbonate buffer, pH 9.5), then washed three times with PBS. PBMC are isolated by F/H gradient centrifugation from human peripheral blood and added to quadruplicate wells (5×10^4 /well) of mAb coated plates in RPMI containing 10% FCS and P/S in the presence of varying concentrations of agonists or antagonists of the invention (total volume 200 μl). Relevant protein buffer and medium alone are controls. After 48 hr. culture at 37 degrees C, plates are spun for 2 min. at 1000 rpm and 100 μl of supernatant is removed and stored -20 degrees C for measurement of IL-2 (or other cytokines) if effect on proliferation is observed. Wells are supplemented with 100 μl of medium containing 0.5 uCi of ^3H -thymidine and cultured at 37 degrees C for 18-24 hr. Wells are harvested and incorporation of ^3H -thymidine used as a measure of proliferation. Anti-CD3 alone is the positive control for proliferation. IL-2 (100 U/ml) is also used as a control which enhances proliferation. Control antibody which does not induce proliferation of T cells is used as the negative controls for the effects of agonists or antagonists of the invention.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 23: Effect of Agonists or Antagonists of the Invention on the Expression of MHC Class II, Costimulatory and Adhesion Molecules and Cell Differentiation of Monocytes and Monocyte-Derived Human Dendritic Cells

Dendritic cells are generated by the expansion of proliferating precursors found in the peripheral blood: adherent PBMC or elutriated monocytic fractions are cultured for 7-10 days with GM-CSF (50 ng/ml) and IL-4 (20 ng/ml). These dendritic cells have the characteristic phenotype of immature cells (expression of CD1, CD80, CD86, CD40 and MHC class II antigens). Treatment with activating factors, such as TNF- α , causes a rapid change in surface phenotype (increased expression of MHC class I and II, costimulatory and adhesion molecules, downregulation of FC γ RII, upregulation of CD83). These changes correlate with increased antigen-presenting capacity and with functional maturation of the dendritic cells.

FACS analysis of surface antigens is performed as follows. Cells are treated 1-3 days with increasing concentrations of agonist or antagonist of the invention or LPS (positive control), washed with PBS containing 1% BSA and 0.02 mM sodium azide, and then incubated with 1:20 dilution of appropriate FITC- or PE-labeled monoclonal antibodies for 30 minutes at 4 degrees C. After an additional wash, the labeled cells are analyzed by flow cytometry on a FACScan (Becton Dickinson).

Effect on the production of cytokines. Cytokines generated by dendritic cells, in particular IL-12, are important in the initiation of T-cell dependent immune responses. IL-12 strongly influences the development of Th1 helper T-cell immune response, and induces cytotoxic T and NK cell function. An ELISA is used to measure the IL-12 release as follows. Dendritic cells (10^6 /ml) are treated with increasing concentrations of agonists or antagonists of the invention for 24 hours. LPS (100 ng/ml) is added to the cell culture as positive control. Supernatants from the cell cultures are then collected and analyzed for IL-12 content using commercial ELISA kit (e.g., R & D Systems (Minneapolis, MN)). The standard protocols provided with the kits are used.

Effect on the expression of MHC Class II, costimulatory and adhesion molecules. Three major families of cell surface antigens can be identified on monocytes: adhesion molecules, molecules involved in antigen presentation, and Fc receptor. Modulation of the expression of MHC class II antigens and other costimulatory molecules, such as B7 and ICAM-1, may result in changes in the antigen presenting capacity of monocytes and ability to induce T cell activation. Increase expression of Fc receptors may correlate with improved monocyte cytotoxic activity, cytokine release and phagocytosis.

FACS analysis is used to examine the surface antigens as follows. Monocytes are treated 1-5 days with increasing concentrations of agonists or antagonists of the invention or LPS (positive control), washed with PBS containing 1% BSA and 0.02 mM sodium azide, and then incubated with 1:20 dilution of appropriate FITC- or PE-labeled monoclonal antibodies for 30 minutes at 4 degreesC. After an additional wash, the labeled cells are analyzed by flow cytometry on a FACScan (Becton Dickinson).

Monocyte activation and/or increased survival. Assays for molecules that activate (or alternatively, inactivate) monocytes and/or increase monocyte survival (or alternatively, decrease monocyte survival) are known in the art and may routinely be applied to determine whether a molecule of the invention functions as an inhibitor or activator of monocytes. Agonists or antagonists of the invention can be screened using the three assays described below. For each of these assays, Peripheral blood mononuclear cells (PBMC) are purified from single donor leukopacks (American Red Cross, Baltimore, MD) by centrifugation through a Histopaque gradient (Sigma). Monocytes are isolated from PBMC by counterflow centrifugal elutriation.

Monocyte Survival Assay. Human peripheral blood monocytes progressively lose viability when cultured in absence of serum or other stimuli. Their death results from internally regulated process (apoptosis). Addition to the culture of activating factors, such as TNF-alpha dramatically improves cell survival and prevents DNA fragmentation. Propidium iodide (PI) staining is used to measure apoptosis as follows. Monocytes are cultured for 48 hours in polypropylene tubes in serum-free medium (positive control), in the presence of 100 ng/ml TNF-alpha (negative control), and in the presence of varying concentrations of the compound to be tested. Cells are suspended at a concentration of 2×10^6 /ml in PBS containing PI at a

final concentration of 5 $\mu\text{g/ml}$, and then incubated at room temperature for 5 minutes before FACSscan analysis. PI uptake has been demonstrated to correlate with DNA fragmentation in this experimental paradigm.

5 Effect on cytokine release. An important function of monocytes/macrophages is their regulatory activity on other cellular populations of the immune system through the release of cytokines after stimulation. An ELISA to measure cytokine release is performed as follows. Human monocytes are incubated at a density of 5×10^5 cells/ml with increasing concentrations of agonists or antagonists of the invention and under the same conditions, but
10 in the absence of agonists or antagonists. For IL-12 production, the cells are primed overnight with IFN (100 U/ml) in presence of agonist or antagonist of the invention. LPS (10 ng/ml) is then added. Conditioned media are collected after 24h and kept frozen until use. Measurement of TNF-alpha, IL-10, MCP-1 and IL-8 is then performed using a commercially available ELISA kit (e. g, R & D Systems (Minneapolis, MN)) and applying the standard
15 protocols provided with the kit.

Oxidative burst. Purified monocytes are plated in 96-w plate at 2×10^5 cell/well. Increasing concentrations of agonists or antagonists of the invention are added to the wells in a total volume of 0.2 ml culture medium (RPMI 1640 + 10% FCS, glutamine and antibiotics). After
20 3 days incubation, the plates are centrifuged and the medium is removed from the wells. To the macrophage monolayers, 0.2 ml per well of phenol red solution (140 mM NaCl, 10 mM potassium phosphate buffer pH 7.0, 5.5 mM dextrose, 0.56 mM phenol red and 19 U/ml of HRPO) is added, together with the stimulant (200 nM PMA). The plates are incubated at 37°C for 2 hours and the reaction is stopped by adding 20 μl 1N NaOH per well. The
25 absorbance is read at 610 nm. To calculate the amount of H_2O_2 produced by the macrophages, a standard curve of a H_2O_2 solution of known molarity is performed for each experiment.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test
30 the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 24: Biological Effects of Agonists or Antagonists of the Invention

Astrocyte and Neuronal Assays.

5 Agonists or antagonists of the invention, expressed in *Escherichia coli* and purified as described above, can be tested for activity in promoting the survival, neurite outgrowth, or phenotypic differentiation of cortical neuronal cells and for inducing the proliferation of glial fibrillary acidic protein immunopositive cells, astrocytes. The selection of cortical cells for the bioassay is based on the prevalent expression of FGF-1 and FGF-2 in cortical structures
10 and on the previously reported enhancement of cortical neuronal survival resulting from FGF-2 treatment. A thymidine incorporation assay, for example, can be used to elucidate an agonist or antagonist of the invention's activity on these cells.

Moreover, previous reports describing the biological effects of FGF-2 (basic FGF) on cortical or hippocampal neurons *in vitro* have demonstrated increases in both neuron survival
15 and neurite outgrowth (Walicke et al., "Fibroblast growth factor promotes survival of dissociated hippocampal neurons and enhances neurite extension." *Proc. Natl. Acad. Sci. USA* 83:3012-3016. (1986), assay herein incorporated by reference in its entirety). However, reports from experiments done on PC-12 cells suggest that these two responses are not necessarily synonymous and may depend on not only which FGF is being tested but also on
20 which receptor(s) are expressed on the target cells. Using the primary cortical neuronal culture paradigm, the ability of an agonist or antagonist of the invention to induce neurite outgrowth can be compared to the response achieved with FGF-2 using, for example, a thymidine incorporation assay.

25 Fibroblast and endothelial cell assays.

Human lung fibroblasts are obtained from Clonetics (San Diego, CA) and maintained in growth media from Clonetics. Dermal microvascular endothelial cells are obtained from Cell Applications (San Diego, CA). For proliferation assays, the human lung fibroblasts and dermal microvascular endothelial cells can be cultured at 5,000 cells/well in a 96-well plate
30 for one day in growth medium. The cells are then incubated for one day in 0.1% BSA basal medium. After replacing the medium with fresh 0.1% BSA medium, the cells are incubated with the test proteins for 3 days. Alamar Blue (Alamar Biosciences, Sacramento, CA) is

added to each well to a final concentration of 10%. The cells are incubated for 4 hr. Cell viability is measured by reading in a CytoFluor fluorescence reader. For the PGE₂ assays, the human lung fibroblasts are cultured at 5,000 cells/well in a 96-well plate for one day. After a medium change to 0.1% BSA basal medium, the cells are incubated with FGF-2 or agonists or antagonists of the invention with or without IL-1 α for 24 hours. The supernatants are collected and assayed for PGE₂ by EIA kit (Cayman, Ann Arbor, MI). For the IL-6 assays, the human lung fibroblasts are cultured at 5,000 cells/well in a 96-well plate for one day. After a medium change to 0.1% BSA basal medium, the cells are incubated with FGF-2 or with or without agonists or antagonists of the invention IL-1 α for 24 hours. The supernatants are collected and assayed for IL-6 by ELISA kit (Endogen, Cambridge, MA).

Human lung fibroblasts are cultured with FGF-2 or agonists or antagonists of the invention for 3 days in basal medium before the addition of Alamar Blue to assess effects on growth of the fibroblasts. FGF-2 should show a stimulation at 10 - 2500 ng/ml which can be used to compare stimulation with agonists or antagonists of the invention.

Parkinson Models.

The loss of motor function in Parkinson's disease is attributed to a deficiency of striatal dopamine resulting from the degeneration of the nigrostriatal dopaminergic projection neurons. An animal model for Parkinson's that has been extensively characterized involves the systemic administration of 1-methyl-4 phenyl 1,2,3,6-tetrahydropyridine (MPTP). In the CNS, MPTP is taken-up by astrocytes and catabolized by monoamine oxidase B to 1-methyl-4-phenyl pyridine (MPP⁺) and released. Subsequently, MPP⁺ is actively accumulated in dopaminergic neurons by the high-affinity reuptake transporter for dopamine. MPP⁺ is then concentrated in mitochondria by the electrochemical gradient and selectively inhibits nicotinamide adenine disphosphate: ubiquinone oxidoreductionase (complex I), thereby interfering with electron transport and eventually generating oxygen radicals.

It has been demonstrated in tissue culture paradigms that FGF-2 (basic FGF) has trophic activity towards nigral dopaminergic neurons (Ferrari et al., Dev. Biol. 1989). Recently, Dr. Unsicker's group has demonstrated that administering FGF-2 in gel foam implants in the striatum results in the near complete protection of nigral dopaminergic neurons from the toxicity associated with MPTP exposure (Otto and Unsicker, J. Neuroscience, 1990).

Based on the data with FGF-2, agonists or antagonists of the invention can be evaluated to determine whether it has an action similar to that of FGF-2 in enhancing dopaminergic neuronal survival *in vitro* and it can also be tested *in vivo* for protection of dopaminergic neurons in the striatum from the damage associated with MPTP treatment. The potential effect of an agonist or antagonist of the invention is first examined *in vitro* in a dopaminergic neuronal cell culture paradigm. The cultures are prepared by dissecting the midbrain floor plate from gestation day 14 Wistar rat embryos. The tissue is dissociated with trypsin and seeded at a density of 200,000 cells/cm² on polyorthinine-laminin coated glass coverslips. The cells are maintained in Dulbecco's Modified Eagle's medium and F12 medium containing hormonal supplements (N1). The cultures are fixed with paraformaldehyde after 8 days *in vitro* and are processed for tyrosine hydroxylase, a specific marker for dopaminergic neurons, immunohistochemical staining. Dissociated cell cultures are prepared from embryonic rats. The culture medium is changed every third day and the factors are also added at that time.

Since the dopaminergic neurons are isolated from animals at gestation day 14, a developmental time which is past the stage when the dopaminergic precursor cells are proliferating, an increase in the number of tyrosine hydroxylase immunopositive neurons would represent an increase in the number of dopaminergic neurons surviving *in vitro*. Therefore, if an agonist or antagonist of the invention acts to prolong the survival of dopaminergic neurons, it would suggest that the agonist or antagonist may be involved in Parkinson's Disease.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 25: The Effect of Agonists or Antagonists of the Invention on the Growth of Vascular Endothelial Cells

On day 1, human umbilical vein endothelial cells (HUVEC) are seeded at $2-5 \times 10^4$ cells/35 mm dish density in M199 medium containing 4% fetal bovine serum (FBS), 16 units/ml heparin, and 50 units/ml endothelial cell growth supplements (ECGS, Biotechnology,

Inc.). On day 2, the medium is replaced with M199 containing 10% FBS, 8 units/ml heparin. An agonist or antagonist of the invention, and positive controls, such as VEGF and basic FGF (bFGF) are added, at varying concentrations. On days 4 and 6, the medium is replaced. On day 8, cell number is determined with a Coulter Counter.

5 An increase in the number of HUVEC cells indicates that the compound of the invention may proliferate vascular endothelial cells, while a decrease in the number of HUVEC cell indicates that the compound of the invention inhibits vascular endothelial cells.

The studies described in this example tested activity of a polypeptide of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity
10 of polynucleotides (e.g., gene therapy), agonists, and/or antagonists of the invention.

Example 26: Rat Corneal Wound Healing Model

This animal model shows the effect of an agonist or antagonist of the invention on
15 neovascularization. The experimental protocol includes:

a) Making a 1-1.5 mm long incision from the center of cornea into the stromal layer.

b) Inserting a spatula below the lip of the incision facing the outer corner of the eye.

20 c) Making a pocket (its base is 1-1.5 mm from the edge of the eye).

d) Positioning a pellet, containing 50ng- 5ug of an agonist or antagonist of the invention, within the pocket.

e) Treatment with an agonist or antagonist of the invention can also be applied topically to the corneal wounds in a dosage range of 20mg - 500mg (daily treatment for five
25 days).

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 27: Diabetic Mouse and Glucocorticoid-Impaired Wound Healing Models

A. Diabetic db+/db+ Mouse Model.

To demonstrate that an agonist or antagonist of the invention accelerates the healing process, the genetically diabetic mouse model of wound healing is used. The full thickness wound healing model in the db+/db+ mouse is a well characterized, clinically relevant and reproducible model of impaired wound healing. Healing of the diabetic wound is dependent on formation of granulation tissue and re-epithelialization rather than contraction (Gartner, M.H. *et al.*, *J. Surg. Res.* 52:389 (1992); Greenhalgh, D.G. *et al.*, *Am. J. Pathol.* 136:1235 (1990)).

The diabetic animals have many of the characteristic features observed in Type II diabetes mellitus. Homozygous (db+/db+) mice are obese in comparison to their normal heterozygous (db+/+m) littermates. Mutant diabetic (db+/db+) mice have a single autosomal recessive mutation on chromosome 4 (db+) (Coleman *et al.* *Proc. Natl. Acad. Sci. USA* 77:283-293 (1982)). Animals show polyphagia, polydipsia and polyuria. Mutant diabetic mice (db+/db+) have elevated blood glucose, increased or normal insulin levels, and suppressed cell-mediated immunity (Mandel *et al.*, *J. Immunol.* 120:1375 (1978); Debray-Sachs, M. *et al.*, *Clin. Exp. Immunol.* 51(1):1-7 (1983); Leiter *et al.*, *Am. J. of Pathol.* 114:46-55 (1985)). Peripheral neuropathy, myocardial complications, and microvascular lesions, basement membrane thickening and glomerular filtration abnormalities have been described in these animals (Norido, F. *et al.*, *Exp. Neurol.* 83(2):221-232 (1984); Robertson *et al.*, *Diabetes* 29(1):60-67 (1980); Giacomelli *et al.*, *Lab Invest.* 40(4):460-473 (1979); Coleman, D.L., *Diabetes* 31 (Suppl):1-6 (1982)). These homozygous diabetic mice develop hyperglycemia that is resistant to insulin analogous to human type II diabetes (Mandel *et al.*, *J. Immunol.* 120:1375-1377 (1978)).

The characteristics observed in these animals suggests that healing in this model may be similar to the healing observed in human diabetes (Greenhalgh, *et al.*, *Am. J. of Pathol.* 136:1235-1246 (1990)).

Genetically diabetic female C57BL/KsJ (db+/db+) mice and their non-diabetic (db+/+m) heterozygous littermates are used in this study (Jackson Laboratories). The animals are purchased at 6 weeks of age and are 8 weeks old at the beginning of the study. Animals are individually housed and received food and water ad libitum. All manipulations are performed using aseptic techniques. The experiments are conducted according to the

rules and guidelines of Human Genome Sciences, Inc. Institutional Animal Care and Use Committee and the Guidelines for the Care and Use of Laboratory Animals.

Wounding protocol is performed according to previously reported methods (Tsuboi, R. and Rifkin, D.B., *J. Exp. Med.* 172:245-251 (1990)). Briefly, on the day of wounding, animals are anesthetized with an intraperitoneal injection of Avertin (0.01 mg/mL), 2,2,2-tribromoethanol and 2-methyl-2-butanol dissolved in deionized water. The dorsal region of the animal is shaved and the skin washed with 70% ethanol solution and iodine. The surgical area is dried with sterile gauze prior to wounding. An 8 mm full-thickness wound is then created using a Keyes tissue punch. Immediately following wounding, the surrounding skin is gently stretched to eliminate wound expansion. The wounds are left open for the duration of the experiment. Application of the treatment is given topically for 5 consecutive days commencing on the day of wounding. Prior to treatment, wounds are gently cleansed with sterile saline and gauze sponges.

Wounds are visually examined and photographed at a fixed distance at the day of surgery and at two day intervals thereafter. Wound closure is determined by daily measurement on days 1-5 and on day 8. Wounds are measured horizontally and vertically using a calibrated Jameson caliper. Wounds are considered healed if granulation tissue is no longer visible and the wound is covered by a continuous epithelium.

An agonist or antagonist of the invention is administered using at a range different doses, from 4mg to 500mg per wound per day for 8 days in vehicle. Vehicle control groups received 50mL of vehicle solution.

Animals are euthanized on day 8 with an intraperitoneal injection of sodium pentobarbital (300mg/kg). The wounds and surrounding skin are then harvested for histology and immunohistochemistry. Tissue specimens are placed in 10% neutral buffered formalin in tissue cassettes between biopsy sponges for further processing.

Three groups of 10 animals each (5 diabetic and 5 non-diabetic controls) are evaluated: 1) Vehicle placebo control, 2) untreated group, and 3) treated group.

Wound closure is analyzed by measuring the area in the vertical and horizontal axis and obtaining the total square area of the wound. Contraction is then estimated by establishing the differences between the initial wound area (day 0) and that of post treatment (day 8). The wound area on day 1 is 64mm^2 , the corresponding size of the dermal punch. Calculations are made using the following formula:

[Open area on day 8] - [Open area on day 1] / [Open area on day 1]

Specimens are fixed in 10% buffered formalin and paraffin embedded blocks are sectioned
5 perpendicular to the wound surface (5mm) and cut using a Reichert-Jung microtome. Routine hematoxylin-eosin (H&E) staining is performed on cross-sections of bisected wounds. Histologic examination of the wounds are used to assess whether the healing process and the morphologic appearance of the repaired skin is altered by treatment with an agonist or antagonist of the invention. This assessment included verification of the presence
10 of cell accumulation, inflammatory cells, capillaries, fibroblasts, re-epithelialization and epidermal maturity (Greenhalgh, D.G. *et al.*, *Am. J. Pathol.* 136:1235 (1990)). A calibrated lens micrometer is used by a blinded observer.

Tissue sections are also stained immunohistochemically with a polyclonal rabbit anti-human keratin antibody using ABC Elite detection system. Human skin is used as a positive tissue
15 control while non-immune IgG is used as a negative control. Keratinocyte growth is determined by evaluating the extent of reepithelialization of the wound using a calibrated lens micrometer.

Proliferating cell nuclear antigen/cyclin (PCNA) in skin specimens is demonstrated by using anti-PCNA antibody (1:50) with an ABC Elite detection system. Human colon
20 cancer served as a positive tissue control and human brain tissue is used as a negative tissue control. Each specimen included a section with omission of the primary antibody and substitution with non-immune mouse IgG. Ranking of these sections is based on the extent of proliferation on a scale of 0-8, the lower side of the scale reflecting slight proliferation to the higher side reflecting intense proliferation.

25 Experimental data are analyzed using an unpaired t test. A p value of < 0.05 is considered significant.

B. Steroid Impaired Rat Model

The inhibition of wound healing by steroids has been well documented in various *in*
30 *vitro* and *in vivo* systems (Wahl, Glucocorticoids and Wound healing. In: Anti-Inflammatory Steroid Action: Basic and Clinical Aspects. 280-302 (1989); Wahlet *al.*, *J. Immunol.* 115: 476-481 (1975); Werb *et al.*, *J. Exp. Med.* 147:1684-1694 (1978)). Glucocorticoids retard

wound healing by inhibiting angiogenesis, decreasing vascular permeability (Ebert *et al.*, *An. Intern. Med.* 37:701-705 (1952)), fibroblast proliferation, and collagen synthesis (Beck *et al.*, *Growth Factors*. 5: 295-304 (1991); Haynes *et al.*, *J. Clin. Invest.* 61: 703-797 (1978)) and producing a transient reduction of circulating monocytes (Haynes *et al.*, *J. Clin. Invest.* 61: 703-797 (1978); Wahl, "Glucocorticoids and wound healing", *In: Antiinflammatory Steroid Action: Basic and Clinical Aspects*, Academic Press, New York, pp. 280-302 (1989)). The systemic administration of steroids to impaired wound healing is a well establish phenomenon in rats (Beck *et al.*, *Growth Factors*. 5: 295-304 (1991); Haynes *et al.*, *J. Clin. Invest.* 61: 703-797 (1978); Wahl, "Glucocorticoids and wound healing", *In: Antiinflammatory Steroid Action: Basic and Clinical Aspects*, Academic Press, New York, pp. 280-302 (1989); Pierce *et al.*, *Proc. Natl. Acad. Sci. USA* 86: 2229-2233 (1989)).

To demonstrate that an agonist or antagonist of the invention can accelerate the healing process, the effects of multiple topical applications of the agonist or antagonist on full thickness excisional skin wounds in rats in which healing has been impaired by the systemic administration of methylprednisolone is assessed.

Young adult male Sprague Dawley rats weighing 250-300 g (Charles River Laboratories) are used in this example. The animals are purchased at 8 weeks of age and are 9 weeks old at the beginning of the study. The healing response of rats is impaired by the systemic administration of methylprednisolone (17mg/kg/rat intramuscularly) at the time of wounding. Animals are individually housed and received food and water *ad libitum*. All manipulations are performed using aseptic techniques. This study is conducted according to the rules and guidelines of Human Genome Sciences, Inc. Institutional Animal Care and Use Committee and the Guidelines for the Care and Use of Laboratory Animals.

The wounding protocol is followed according to section A, above. On the day of wounding, animals are anesthetized with an intramuscular injection of ketamine (50 mg/kg) and xylazine (5 mg/kg). The dorsal region of the animal is shaved and the skin washed with 70% ethanol and iodine solutions. The surgical area is dried with sterile gauze prior to wounding. An 8 mm full-thickness wound is created using a Keyes tissue punch. The wounds are left open for the duration of the experiment. Applications of the testing materials are given topically once a day for 7 consecutive days commencing on the day of wounding and subsequent to methylprednisolone administration. Prior to treatment, wounds are gently cleansed with sterile saline and gauze sponges.

Wounds are visually examined and photographed at a fixed distance at the day of wounding and at the end of treatment. Wound closure is determined by daily measurement on days 1-5 and on day 8. Wounds are measured horizontally and vertically using a calibrated Jameson caliper. Wounds are considered healed if granulation tissue is no longer visible and the wound is covered by a continuous epithelium.

The agonist or antagonist of the invention is administered using at a range different doses, from 4mg to 500mg per wound per day for 8 days in vehicle. Vehicle control groups received 50mL of vehicle solution.

Animals are euthanized on day 8 with an intraperitoneal injection of sodium pentobarbital (300mg/kg). The wounds and surrounding skin are then harvested for histology. Tissue specimens are placed in 10% neutral buffered formalin in tissue cassettes between biopsy sponges for further processing.

Four groups of 10 animals each (5 with methylprednisolone and 5 without glucocorticoid) are evaluated: 1) Untreated group 2) Vehicle placebo control 3) treated groups.

Wound closure is analyzed by measuring the area in the vertical and horizontal axis and obtaining the total area of the wound. Closure is then estimated by establishing the differences between the initial wound area (day 0) and that of post treatment (day 8). The wound area on day 1 is 64mm², the corresponding size of the dermal punch. Calculations are made using the following formula:

$$[\text{Open area on day 8}] - [\text{Open area on day 1}] / [\text{Open area on day 1}]$$

Specimens are fixed in 10% buffered formalin and paraffin embedded blocks are sectioned perpendicular to the wound surface (5mm) and cut using an Olympus microtome. Routine hematoxylin-eosin (H&E) staining is performed on cross-sections of bisected wounds. Histologic examination of the wounds allows assessment of whether the healing process and the morphologic appearance of the repaired skin is improved by treatment with an agonist or antagonist of the invention. A calibrated lens micrometer is used by a blinded observer to determine the distance of the wound gap.

Experimental data are analyzed using an unpaired t test. A p value of < 0.05 is considered significant.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

5

Example 28: Lymphadema Animal Model

The purpose of this experimental approach is to create an appropriate and consistent lymphedema model for testing the therapeutic effects of an agonist or antagonist of the invention in lymphangiogenesis and re-establishment of the lymphatic circulatory system in the rat hind limb. Effectiveness is measured by swelling volume of the affected limb, quantification of the amount of lymphatic vasculature, total blood plasma protein, and histopathology. Acute lymphedema is observed for 7-10 days. Perhaps more importantly, the chronic progress of the edema is followed for up to 3-4 weeks.

15 Prior to beginning surgery, blood sample is drawn for protein concentration analysis. Male rats weighing approximately ~350g are dosed with Pentobarbital. Subsequently, the right legs are shaved from knee to hip. The shaved area is swabbed with gauze soaked in 70% EtOH. Blood is drawn for serum total protein testing. Circumference and volumetric measurements are made prior to injecting dye into paws after marking 2 measurement levels
20 (0.5 cm above heel, at mid-pt of dorsal paw). The intradermal dorsum of both right and left paws are injected with 0.05 ml of 1% Evan's Blue. Circumference and volumetric measurements are then made following injection of dye into paws.

Using the knee joint as a landmark, a mid-leg inguinal incision is made circumferentially allowing the femoral vessels to be located. Forceps and hemostats are used
25 to dissect and separate the skin flaps. After locating the femoral vessels, the lymphatic vessel that runs along side and underneath the vessel(s) is located. The main lymphatic vessels in this area are then electrically coagulated or suture ligated.

Using a microscope, muscles in back of the leg (near the semitendinosus and adductors) are bluntly dissected. The popliteal lymph node is then located. The 2 proximal
30 and 2 distal lymphatic vessels and distal blood supply of the popliteal node are then and ligated by suturing. The popliteal lymph node, and any accompanying adipose tissue, is then removed by cutting connective tissues.

Care is taken to control any mild bleeding resulting from this procedure. After lymphatics are occluded, the skin flaps are sealed by using liquid skin (Vetbond) (AJ Buck). The separated skin edges are sealed to the underlying muscle tissue while leaving a gap of ~0.5 cm around the leg. Skin also may be anchored by suturing to underlying muscle when
5 necessary.

To avoid infection, animals are housed individually with mesh (no bedding). Recovering animals are checked daily through the optimal edematous peak, which typically occurred by day 5-7. The plateau edematous peak are then observed. To evaluate the intensity of the lymphedema, the circumference and volumes of 2 designated places on each
10 paw before operation and daily for 7 days are measured. The effect plasma proteins on lymphedema is determined and whether protein analysis is a useful testing perimeter is also investigated. The weights of both control and edematous limbs are evaluated at 2 places. Analysis is performed in a blind manner.

Circumference Measurements: Under brief gas anesthetic to prevent limb movement,
15 a cloth tape is used to measure limb circumference. Measurements are done at the ankle bone and dorsal paw by 2 different people then those 2 readings are averaged. Readings are taken from both control and edematous limbs.

Volumetric Measurements: On the day of surgery, animals are anesthetized with Pentobarbital and are tested prior to surgery. For daily volumetrics animals are under brief
20 halothane anesthetic (rapid immobilization and quick recovery), both legs are shaved and equally marked using waterproof marker on legs. Legs are first dipped in water, then dipped into instrument to each marked level then measured by Buxco edema software(Chen/Victor). Data is recorded by one person, while the other is dipping the limb to marked area.

Blood-plasma protein measurements: Blood is drawn, spun, and serum separated
25 prior to surgery and then at conclusion for total protein and Ca²⁺ comparison.

Limb Weight Comparison: After drawing blood, the animal is prepared for tissue collection. The limbs are amputated using a quillitine, then both experimental and control legs are cut at the ligature and weighed. A second weighing is done as the tibio-cacaneal joint is disarticulated and the foot is weighed.

Histological Preparations: The transverse muscle located behind the knee (popliteal)
30 area is dissected and arranged in a metal mold, filled with freezeGel, dipped into cold

methylbutane, placed into labeled sample bags at - 80EC until sectioning. Upon sectioning, the muscle is observed under fluorescent microscopy for lymphatics..

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 29: Suppression of TNF alpha-induced adhesion molecule expression by a Agonist or Antagonist of the Invention

The recruitment of lymphocytes to areas of inflammation and angiogenesis involves specific receptor-ligand interactions between cell surface adhesion molecules (CAMs) on lymphocytes and the vascular endothelium. The adhesion process, in both normal and pathological settings, follows a multi-step cascade that involves intercellular adhesion molecule-1 (ICAM-1), vascular cell adhesion molecule-1 (VCAM-1), and endothelial leukocyte adhesion molecule-1 (E-selectin) expression on endothelial cells (EC). The expression of these molecules and others on the vascular endothelium determines the efficiency with which leukocytes may adhere to the local vasculature and extravasate into the local tissue during the development of an inflammatory response. The local concentration of cytokines and growth factor participate in the modulation of the expression of these CAMs.

Tumor necrosis factor alpha (TNF-a), a potent proinflammatory cytokine, is a stimulator of all three CAMs on endothelial cells and may be involved in a wide variety of inflammatory responses, often resulting in a pathological outcome.

The potential of an agonist or antagonist of the invention to mediate a suppression of TNF-a induced CAM expression can be examined. A modified ELISA assay which uses ECs as a solid phase absorbent is employed to measure the amount of CAM expression on TNF-a treated ECs when co-stimulated with a member of the FGF family of proteins.

To perform the experiment, human umbilical vein endothelial cell (HUVEC) cultures are obtained from pooled cord harvests and maintained in growth medium (EGM-2; Clonetics, San Diego, CA) supplemented with 10% FCS and 1% penicillin/streptomycin in a 37 degree C humidified incubator containing 5% CO₂. HUVECs are seeded in 96-well plates at concentrations of 1 x 10⁴ cells/well in EGM medium at 37 degree C for 18-24 hrs or until confluent. The monolayers are subsequently washed 3 times with a serum-free solution

of RPMI-1640 supplemented with 100 U/ml penicillin and 100 mg/ml streptomycin, and treated with a given cytokine and/or growth factor(s) for 24 h at 37 degree C. Following incubation, the cells are then evaluated for CAM expression.

Human Umbilical Vein Endothelial cells (HUVECs) are grown in a standard 96 well plate to confluence. Growth medium is removed from the cells and replaced with 90 ul of 199 Medium (10% FBS). Samples for testing and positive or negative controls are added to the plate in triplicate (in 10 ul volumes). Plates are incubated at 37 degree C for either 5 h (selectin and integrin expression) or 24 h (integrin expression only). Plates are aspirated to remove medium and 100 µl of 0.1% paraformaldehyde-PBS(with Ca++ and Mg++) is added to each well. Plates are held at 4°C for 30 min.

Fixative is then removed from the wells and wells are washed 1X with PBS(+Ca,Mg)+0.5% BSA and drained. Do not allow the wells to dry. Add 10 µl of diluted primary antibody to the test and control wells. Anti-ICAM-1-Biotin, Anti-VCAM-1-Biotin and Anti-E-selectin-Biotin are used at a concentration of 10 µg/ml (1:10 dilution of 0.1 mg/ml stock antibody). Cells are incubated at 37°C for 30 min. in a humidified environment. Wells are washed X3 with PBS(+Ca,Mg)+0.5% BSA.

Then add 20 µl of diluted ExtrAvidin-Alkaline Phosphatase (1:5,000 dilution) to each well and incubated at 37°C for 30 min. Wells are washed X3 with PBS(+Ca,Mg)+0.5% BSA. 1 tablet of p-Nitrophenol Phosphate pNPP is dissolved in 5 ml of glycine buffer (pH 10.4). 100 µl of pNPP substrate in glycine buffer is added to each test well. Standard wells in triplicate are prepared from the working dilution of the ExtrAvidin-Alkaline Phosphatase in glycine buffer: 1:5,000 (10^0) > $10^{-0.5}$ > 10^{-1} > $10^{-1.5}$. 5 µl of each dilution is added to triplicate wells and the resulting AP content in each well is 5.50 ng, 1.74 ng, 0.55 ng, 0.18 ng. 100 µl of pNPP reagent must then be added to each of the standard wells. The plate must be incubated at 37°C for 4h. A volume of 50 µl of 3M NaOH is added to all wells. The results are quantified on a plate reader at 405 nm. The background subtraction option is used on blank wells filled with glycine buffer only. The template is set up to indicate the concentration of AP-conjugate in each standard well [5.50 ng; 1.74 ng; 0.55 ng; 0.18 ng]. Results are indicated as amount of bound AP-conjugate in each sample.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 30: TAQMAN

Quantitative PCR (QPCR). Total RNA from cells in culture are extracted by Trizol
5 separation as recommended by the supplier (LifeTechnologies). (Total RNA is treated with
DNase I (Life Technologies) to remove any contaminating genomic DNA before reverse
transcription.) Total RNA (50 ng) is used in a one-step, 50ul, RT-QPCR, consisting of
Taqman Buffer A (Perkin-Elmer; 50 mM KCl/10 mM Tris, pH 8.3), 5.5 mM MgCl₂, 240 μM
each dNTP, 0.4 units RNase inhibitor(Promega), 8%glycerol, 0.012% Tween-20, 0.05%
10 gelatin, 0.3uM primers, 0.1uM probe, 0.025units Amplitaq Gold (Perkin-Elmer) and 2.5 units
Superscript II reverse transcriptase (Life Technologies). As a control for genomic
contamination, parallel reactions are setup without reverse transcriptase. The relative
abundance of (unknown) and 18S RNAs are assessed by using the Applied Biosystems Prism
7700 Sequence Detection System (Livak, K. J., Flood, S. J., Marmaro, J., Giusti, W. &
15 Deetz, K. (1995) PCR Methods Appl. 4, 357-362). Reactions are carried out at 48°C for 30
min, 95°C for 10 min, followed by 40 cycles of 95°C for 15s, 60°C for 1 min. Reactions are
performed in triplicate.

Primers (f & r) and FRET probes sets are designed using Primer Express Software
(Perkin-Elmer). Probes are labeled at the 5'-end with the reporter dye 6-FAM and on the 3'-
20 end with the quencher dye TAMRA (Biosource International, Camarillo, CA or Perkin-
Elmer).

Example 31: Production Of Polypeptide of the Invention For High- Throughput Screening Assays

25 The following protocol produces a supernatant containing polypeptide of the present
invention to be tested. This supernatant can then be used in the Screening Assays described
in Examples 33-42.

First, dilute Poly-D-Lysine (644 587 Boehringer-Mannheim) stock solution (1mg/ml
30 in PBS) 1:20 in PBS (w/o calcium or magnesium 17-516F Biowhittaker) for a working
solution of 50ug/ml. Add 200 ul of this solution to each well (24 well plates) and incubate at
RT for 20 minutes. Be sure to distribute the solution over each well (note: a 12-channel

pipetter may be used with tips on every other channel). Aspirate off the Poly-D-Lysine solution and rinse with 1ml PBS (Phosphate Buffered Saline). The PBS should remain in the well until just prior to plating the cells and plates may be poly-lysine coated in advance for up to two weeks.

- 5 Plate 293T cells (do not carry cells past P+20) at 2×10^5 cells/well in .5ml DMEM(Dulbecco's Modified Eagle Medium)(with 4.5 G/L glucose and L-glutamine (12-604F Biowhittaker))/10% heat inactivated FBS(14-503F Biowhittaker)/1x Penstrep(17-602E Biowhittaker). Let the cells grow overnight.

- 10 The next day, mix together in a sterile solution basin: 300 ul Lipofectamine (18324-012 Gibco/BRL) and 5ml Optimem I (31985070 Gibco/BRL)/96-well plate. With a small volume multi-channel pipetter, aliquot approximately 2ug of an expression vector containing a polynucleotide insert, produced by the methods described in Examples 8-10, into an appropriately labeled 96-well round bottom plate. With a multi-channel pipetter, add 50ul of the Lipofectamine/Optimem I mixture to each well. Pipette up and down gently to mix.
- 15 Incubate at RT 15-45 minutes. After about 20 minutes, use a multi-channel pipetter to add 150ul Optimem I to each well. As a control, one plate of vector DNA lacking an insert should be transfected with each set of transfections.

- Preferably, the transfection should be performed by tag-teaming the following tasks. By tag-teaming, hands on time is cut in half, and the cells do not spend too much time on
- 20 PBS. First, person A aspirates off the media from four 24-well plates of cells, and then person B rinses each well with .5-1ml PBS. Person A then aspirates off PBS rinse, and person B, using a 12-channel pipetter with tips on every other channel, adds the 200ul of DNA/Lipofectamine/Optimem I complex to the odd wells first, then to the even wells, to each row on the 24-well plates. Incubate at 37 degree C for 6 hours.

- 25 While cells are incubating, prepare appropriate media, either 1%BSA in DMEM with 1x penstrep, or HGS CHO-5 media (116.6 mg/L of CaCl_2 (anhyd); 0.00130 mg/L $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$; 0.050 mg/L of $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$; 0.417 mg/L of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$; 311.80 mg/L of Kcl; 28.64 mg/L of MgCl_2 ; 48.84 mg/L of MgSO_4 ; 6995.50 mg/L of NaCl; 2400.0 mg/L of NaHCO_3 ; 62.50 mg/L of $\text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$; 71.02 mg/L of Na_2HPO_4 ; .4320 mg/L of $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$; .002 mg/L of Arachidonic Acid ; 1.022 mg/L of Cholesterol; .070 mg/L of DL-alpha-Tocopherol-Acetate; 0.0520 mg/L of Linoleic Acid; 0.010 mg/L of Linolenic Acid; 0.010 mg/L of Myristic Acid; 0.010 mg/L of Oleic Acid; 0.010 mg/L of Palmitric Acid; 0.010 mg/L
- 30

of Palmitic Acid; 100 mg/L of Pluronic F-68; 0.010 mg/L of Stearic Acid; 2.20 mg/L of Tween 80; 4551 mg/L of D-Glucose; 130.85 mg/ml of L- Alanine; 147.50 mg/ml of L- Arginine-HCL; 7.50 mg/ml of L-Asparagine-H₂O; 6.65 mg/ml of L-Aspartic Acid; 29.56 mg/ml of L-Cystine-2HCL-H₂O; 31.29 mg/ml of L-Cystine-2HCL; 7.35 mg/ml of L-
5 Glutamic Acid; 365.0 mg/ml of L-Glutamine; 18.75 mg/ml of Glycine; 52.48 mg/ml of L- Histidine-HCL-H₂O; 106.97 mg/ml of L-Isoleucine; 111.45 mg/ml of L-Leucine; 163.75 mg/ml of L-Lysine HCL; 32.34 mg/ml of L-Methionine; 68.48 mg/ml of L-Phenylalanine; 40.0 mg/ml of L-Proline; 26.25 mg/ml of L-Serine; 101.05 mg/ml of L-Threonine; 19.22 mg/ml of L-Tryptophan; 91.79 mg/ml of L-Tyrosine-2Na-2H₂O; and 99.65 mg/ml of L-
10 Valine; 0.0035 mg/L of Biotin; 3.24 mg/L of D-Ca Pantothenate; 11.78 mg/L of Choline Chloride; 4.65 mg/L of Folic Acid; 15.60 mg/L of i-Inositol; 3.02 mg/L of Niacinamide; 3.00 mg/L of Pyridoxal HCL; 0.031 mg/L of Pyridoxine HCL; 0.319 mg/L of Riboflavin; 3.17 mg/L of Thiamine HCL; 0.365 mg/L of Thymidine; 0.680 mg/L of Vitamin B12; 25 mM of HEPES Buffer; 2.39 mg/L of Na Hypoxanthine; 0.105 mg/L of Lipoic Acid; 0.081 mg/L of
15 Sodium Putrescine-2HCL; 55.0 mg/L of Sodium Pyruvate; 0.0067 mg/L of Sodium Selenite; 20uM of Ethanolamine; 0.122 mg/L of Ferric Citrate; 41.70 mg/L of Methyl-B-Cyclodextrin complexed with Linoleic Acid; 33.33 mg/L of Methyl-B-Cyclodextrin complexed with Oleic Acid; 10 mg/L of Methyl-B-Cyclodextrin complexed with Retinal Acetate. Adjust osmolarity to 327 mOsm) with 2mm glutamine and 1x penstrep. (BSA (81-068-3 Bayer)
20 100gm dissolved in 1L DMEM for a 10% BSA stock solution). Filter the media and collect 50 ul for endotoxin assay in 15ml polystyrene conical.

The transfection reaction is terminated, preferably by tag-teaming, at the end of the incubation period. Person A aspirates off the transfection media, while person B adds 1.5ml appropriate media to each well. Incubate at 37 degree C for 45 or 72 hours depending on the
25 media used: 1%BSA for 45 hours or CHO-5 for 72 hours.

On day four, using a 300ul multichannel pipetter, aliquot 600ul in one 1ml deep well plate and the remaining supernatant into a 2ml deep well. The supernatants from each well can then be used in the assays described in Examples 33-40.

It is specifically understood that when activity is obtained in any of the assays
30 described below using a supernatant, the activity originates from either the polypeptide of the present invention directly (e.g., as a secreted protein) or by polypeptide of the present invention inducing expression of other proteins, which are then secreted into the supernatant.

Thus, the invention further provides a method of identifying the protein in the supernatant characterized by an activity in a particular assay.

Example 32: Construction of GAS Reporter Construct

5

One signal transduction pathway involved in the differentiation and proliferation of cells is called the Jaks-STATs pathway. Activated proteins in the Jaks-STATs pathway bind to gamma activation site “GAS” elements or interferon-sensitive responsive element (“ISRE”), located in the promoter of many genes. The binding of a protein to these elements alter the expression of the associated gene.

10

GAS and ISRE elements are recognized by a class of transcription factors called Signal Transducers and Activators of Transcription, or “STATs.” There are six members of the STATs family. Stat1 and Stat3 are present in many cell types, as is Stat2 (as response to IFN-alpha is widespread). Stat4 is more restricted and is not in many cell types though it has been found in T helper class I, cells after treatment with IL-12. Stat5 was originally called mammary growth factor, but has been found at higher concentrations in other cells including myeloid cells. It can be activated in tissue culture cells by many cytokines.

15

The STATs are activated to translocate from the cytoplasm to the nucleus upon tyrosine phosphorylation by a set of kinases known as the Janus Kinase (“Jaks”) family. Jaks represent a distinct family of soluble tyrosine kinases and include Tyk2, Jak1, Jak2, and Jak3. These kinases display significant sequence similarity and are generally catalytically inactive in resting cells.

20

The Jaks are activated by a wide range of receptors summarized in the Table below. (Adapted from review by Schidler and Darnell, Ann. Rev. Biochem. 64:621-51 (1995).) A cytokine receptor family, capable of activating Jaks, is divided into two groups: (a) Class 1 includes receptors for IL-2, IL-3, IL-4, IL-6, IL-7, IL-9, IL-11, IL-12, IL-15, Epo, PRL, GH, G-CSF, GM-CSF, LIF, CNTF, and thrombopoietin; and (b) Class 2 includes IFN-a, IFN-g, and IL-10. The Class 1 receptors share a conserved cysteine motif (a set of four conserved cysteines and one tryptophan) and a WSXWS motif (a membrane proximal region encoding Trp-Ser-Xxx-Trp-Ser (SEQ ID NO: 8556)).

25

30

Thus, on binding of a ligand to a receptor, Jaks are activated, which in turn activate STATs, which then translocate and bind to GAS elements. This entire process is

encompassed in the Jaks-STATs signal transduction pathway.

Therefore, activation of the Jaks-STATs pathway, reflected by the binding of the GAS or the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. For example, growth factors and cytokines are known to activate the
5 Jaks-STATs pathway. (See Table below.) Thus, by using GAS elements linked to reporter molecules, activators of the Jaks-STATs pathway can be identified.

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| | <u>Ligand</u> | <u>JAKs</u> | | | | <u>STATs GAS(elements) or ISRE</u> | |
|----|----------------------|-------------|-------------|-------------|-------------|------------------------------------|-----------------|
| | | <u>tyk2</u> | <u>Jak1</u> | <u>Jak2</u> | <u>Jak3</u> | | |
| | <u>IFN family</u> | | | | | | |
| 5 | IFN-a/B | + | + | - | - | 1,2,3 | ISRE |
| | IFN-g | | + | + | - | 1 | GAS |
| | (IRF1>Lys6>IFP) | | | | | | |
| | Il-10 | + | ? | ? | - | 1,3 | |
| 10 | <u>gp130 family</u> | | | | | | |
| | IL-6 (Pleiotrohic) | + | + | + | ? | 1,3 | GAS |
| | (IRF1>Lys6>IFP) | | | | | | |
| | Il-11(Pleiotrohic) | ? | + | ? | ? | 1,3 | |
| | OnM(Pleiotrohic) | ? | + | + | ? | 1,3 | |
| 15 | LIF(Pleiotrohic) | ? | + | + | ? | 1,3 | |
| | CNTF(Pleiotrohic) | -/+ | + | + | ? | 1,3 | |
| | G-CSF(Pleiotrohic) | ? | + | ? | ? | 1,3 | |
| | IL-12(Pleiotrohic) | + | - | + | + | 1,3 | |
| 20 | <u>g-C family</u> | | | | | | |
| | IL-2 (lymphocytes) | - | + | - | + | 1,3,5 | GAS |
| | IL-4 (lymph/myeloid) | - | + | - | + | 6 | GAS (IRF1 = IFP |
| | >>Ly6)(IgH) | | | | | | |
| | IL-7 (lymphocytes) | - | + | - | + | 5 | GAS |
| 25 | IL-9 (lymphocytes) | - | + | - | + | 5 | GAS |
| | IL-13 (lymphocyte) | - | + | ? | ? | 6 | GAS |
| | IL-15 | ? | + | ? | + | 5 | GAS |
| | <u>gp140 family</u> | | | | | | |
| 30 | IL-3 (myeloid) | - | - | + | - | 5 | GAS |
| | (IRF1>IFP>>Ly6) | | | | | | |
| | IL-5 (myeloid) | - | - | + | - | 5 | GAS |
| | GM-CSF (myeloid) | - | - | + | - | 5 | GAS |

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Growth hormone family

| | | | | | | | |
|---|--------------------|---|-----|---|---|-------|--------|
| | GH | ? | - | + | - | 5 | |
| | PRL | ? | +/- | + | - | 1,3,5 | |
| 5 | EPO | ? | - | + | - | 5 | GAS(B- |
| | CAS>IRF1=IFP>>Ly6) | | | | | | |

Receptor Tyrosine Kinases

| | | | | | | | |
|----|-------|---|---|---|---|-----|----------------|
| 10 | EGF | ? | + | + | - | 1,3 | GAS (IRF1) |
| | PDGF | ? | + | + | - | 1,3 | |
| | CSF-1 | ? | + | + | - | 1,3 | GAS (not IRF1) |

To construct a synthetic GAS containing promoter element, which is used in the Biological Assays described in Examples 33-34, a PCR based strategy is employed to generate a GAS-SV40 promoter sequence. The 5' primer contains four tandem copies of the GAS binding site found in the IRF1 promoter and previously demonstrated to bind STATs upon induction with a range of cytokines (Rothman et al., Immunity 1:457-468 (1994).), although other GAS or ISRE elements can be used instead. The 5' primer also contains 18bp of sequence complementary to the SV40 early promoter sequence and is flanked with an XhoI site. The sequence of the 5' primer is:

5':GCGCCTCGAGATTTCCCGAAATCTAGATTTCCCGAAATGATTTCCCGAAAT
GATTTCCCGAAATATCTGCCATCTCAATTAG:3' (SEQ ID NO:8557)

The downstream primer is complementary to the SV40 promoter and is flanked with a Hind III site: 5':GCGGCAAGCTTTTTGCAAAGCCTAGGC:3' (SEQ ID NO:8558)

PCR amplification is performed using the SV40 promoter template present in the B-gal:promoter plasmid obtained from Clontech. The resulting PCR fragment is digested with XhoI/Hind III and subcloned into BLSK2-. (Stratagene.) Sequencing with forward and reverse primers confirms that the insert contains the following sequence:

5':CTCGAGATTTCCCGAAATCTAGATTTCCCGAAATGATTTCCCGAAATGATT
TCCCGAAATATCTGCCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCTAACT
CCGCCCATCCCGCCCCTAACTCCGCCCAGTTCCGCCCATTCTCCGCCCCATGGCTG
ACTAATTTTTTTTATTTATGCAGAGGCCGAGGCCGCCTCGGCCTCTGAGCTATTCC
AGAAGTAGTGAGGAGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAAAGCTT:3'
(SEQ ID NO:8559)

With this GAS promoter element linked to the SV40 promoter, a GAS:SEAP2 reporter construct is next engineered. Here, the reporter molecule is a secreted alkaline phosphatase, or "SEAP." Clearly, however, any reporter molecule can be instead of SEAP, in this or in any of the other Examples. Well known reporter molecules that can be used instead of SEAP include chloramphenicol acetyltransferase (CAT), luciferase, alkaline phosphatase, B-galactosidase, green fluorescent protein (GFP), or any protein detectable by an antibody.

The above sequence confirmed synthetic GAS-SV40 promoter element is subcloned into the pSEAP-Promoter vector obtained from Clontech using HindIII and XhoI, effectively replacing the SV40 promoter with the amplified GAS:SV40 promoter element, to create the

GAS-SEAP vector. However, this vector does not contain a neomycin resistance gene, and therefore, is not preferred for mammalian expression systems.

Thus, in order to generate mammalian stable cell lines expressing the GAS-SEAP reporter, the GAS-SEAP cassette is removed from the GAS-SEAP vector using SalI and NotI, and inserted into a backbone vector containing the neomycin resistance gene, such as pGFP-1 (Clontech), using these restriction sites in the multiple cloning site, to create the GAS-SEAP/Neo vector. Once this vector is transfected into mammalian cells, this vector can then be used as a reporter molecule for GAS binding as described in Examples 33-34.

Other constructs can be made using the above description and replacing GAS with a different promoter sequence. For example, construction of reporter molecules containing NFK-B and EGR promoter sequences are described in Examples 35 and 36. However, many other promoters can be substituted using the protocols described in these Examples. For instance, SRE, IL-2, NFAT, or Osteocalcin promoters can be substituted, alone or in combination (e.g., GAS/NF-KB/EGR, GAS/NF-KB, IL-2/NFAT, or NF-KB/GAS). Similarly, other cell lines can be used to test reporter construct activity, such as HELA (epithelial), HUVEC (endothelial), Reh (B-cell), Saos-2 (osteoblast), HUVAC (aortic), or Cardiomyocyte.

Example 33: High-Throughput Screening Assay for T-cell Activity.

The following protocol is used to assess T-cell activity by identifying factors, and determining whether supernate containing a polypeptide of the invention proliferates and/or differentiates T-cells. T-cell activity is assessed using the GAS/SEAP/Neo construct produced in Example 32. Thus, factors that increase SEAP activity indicate the ability to activate the Jaks-STATS signal transduction pathway. The T-cell used in this assay is Jurkat T-cells (ATCC Accession No. TIB-152), although Molt-3 cells (ATCC Accession No. CRL-1552) and Molt-4 cells (ATCC Accession No. CRL-1582) cells can also be used.

Jurkat T-cells are lymphoblastic CD4⁺ Th1 helper cells. In order to generate stable cell lines, approximately 2 million Jurkat cells are transfected with the GAS-SEAP/neo vector using DMRIE-C (Life Technologies)(transfection procedure described below). The transfected cells are seeded to a density of approximately 20,000 cells per well and transfectants resistant to 1 mg/ml gentamicin selected. Resistant colonies are expanded and then

tested for their response to increasing concentrations of interferon gamma. The dose response of a selected clone is demonstrated.

Specifically, the following protocol will yield sufficient cells for 75 wells containing 200 ul of cells. Thus, it is either scaled up, or performed in multiple to generate sufficient
5 cells for multiple 96 well plates. Jurkat cells are maintained in RPMI + 10% serum with 1%Pen-Strep. Combine 2.5 mls of OPTI-MEM (Life Technologies) with 10 ug of plasmid DNA in a T25 flask. Add 2.5 ml OPTI-MEM containing 50 ul of DMRIE-C and incubate at room temperature for 15-45 mins.

During the incubation period, count cell concentration, spin down the required
10 number of cells (10^7 per transfection), and resuspend in OPTI-MEM to a final concentration of 10^7 cells/ml. Then add 1ml of 1×10^7 cells in OPTI-MEM to T25 flask and incubate at 37 degree C for 6 hrs. After the incubation, add 10 ml of RPMI + 15% serum.

The Jurkat:GAS-SEAP stable reporter lines are maintained in RPMI + 10% serum, 1 mg/ml Gentacin, and 1% Pen-Strep. These cells are treated with supernatants containing
15 polypeptide of the present invention or polypeptide of the present invention induced polypeptides as produced by the protocol described in Example 31.

On the day of treatment with the supernatant, the cells should be washed and resuspended in fresh RPMI + 10% serum to a density of 500,000 cells per ml. The exact number of cells required will depend on the number of supernatants being screened. For one
20 96 well plate, approximately 10 million cells (for 10 plates, 100 million cells) are required.

Transfer the cells to a triangular reservoir boat, in order to dispense the cells into a 96 well dish, using a 12 channel pipette. Using a 12 channel pipette, transfer 200 ul of cells into each well (therefore adding 100, 000 cells per well).

After all the plates have been seeded, 50 ul of the supernatants are transferred directly
25 from the 96 well plate containing the supernatants into each well using a 12 channel pipette. In addition, a dose of exogenous interferon gamma (0.1, 1.0, 10 ng) is added to wells H9, H10, and H11 to serve as additional positive controls for the assay.

The 96 well dishes containing Jurkat cells treated with supernatants are placed in an incubator for 48 hrs (note: this time is variable between 48-72 hrs). 35 ul samples from each
30 well are then transferred to an opaque 96 well plate using a 12 channel pipette. The opaque plates should be covered (using sellophene covers) and stored at -20 degree C until SEAP assays are performed according to Example 37. The plates containing the remaining treated

cells are placed at 4 degree C and serve as a source of material for repeating the assay on a specific well if desired.

As a positive control, 100 Unit/ml interferon gamma can be used which is known to activate Jurkat T cells. Over 30 fold induction is typically observed in the positive control wells.

The above protocol may be used in the generation of both transient, as well as, stable transfected cells, which would be apparent to those of skill in the art.

Example 34: High-Throughput Screening Assay Identifying Myeloid Activity.

The following protocol is used to assess myeloid activity of polypeptide of the present invention by determining whether polypeptide of the present invention proliferates and/or differentiates myeloid cells. Myeloid cell activity is assessed using the GAS/SEAP/Neo construct produced in Example 32. Thus, factors that increase SEAP activity indicate the ability to activate the Jaks-STATS signal transduction pathway. The myeloid cell used in this assay is U937, a pre-monocyte cell line, although TF-1, HL60, or KG1 can be used.

To transiently transfect U937 cells with the GAS/SEAP/Neo construct produced in Example 32, a DEAE-Dextran method (Kharbanda et. al., 1994, Cell Growth & Differentiation, 5:259-265) is used. First, harvest 2×10^7 U937 cells and wash with PBS. The U937 cells are usually grown in RPMI 1640 medium containing 10% heat-inactivated fetal bovine serum (FBS) supplemented with 100 units/ml penicillin and 100 mg/ml streptomycin.

Next, suspend the cells in 1 ml of 20 mM Tris-HCl (pH 7.4) buffer containing 0.5 mg/ml DEAE-Dextran, 8 ug GAS-SEAP2 plasmid DNA, 140 mM NaCl, 5 mM KCl, 375 uM $\text{Na}_2\text{HPO}_4 \cdot 7\text{H}_2\text{O}$, 1 mM MgCl_2 , and 675 uM CaCl_2 . Incubate at 37 degrees C for 45 min.

Wash the cells with RPMI 1640 medium containing 10% FBS and then resuspend in 10 ml complete medium and incubate at 37 degree C for 36 hr.

The GAS-SEAP/U937 stable cells are obtained by growing the cells in 400 ug/ml G418. The G418-free medium is used for routine growth but every one to two months, the cells should be re-grown in 400 ug/ml G418 for couple of passages.

These cells are tested by harvesting 1×10^8 cells (this is enough for ten 96-well plates assay) and wash with PBS. Suspend the cells in 200 ml above described growth medium,

with a final density of 5×10^5 cells/ml. Plate 200 μ l cells per well in the 96-well plate (or 1×10^5 cells/well).

Add 50 μ l of the supernatant prepared by the protocol described in Example 31. Incubate at 37 degree C for 48 to 72 hr. As a positive control, 100 Unit/ml interferon gamma can be used which is known to activate U937 cells. Over 30 fold induction is typically observed in the positive control wells. SEAP assay the supernatant according to the protocol described in Example 37.

Example 35: High-Throughput Screening Assay Identifying Neuronal Activity.

When cells undergo differentiation and proliferation, a group of genes are activated through many different signal transduction pathways. One of these genes, EGR1 (early growth response gene 1), is induced in various tissues and cell types upon activation. The promoter of EGR1 is responsible for such induction. Using the EGR1 promoter linked to reporter molecules, activation of cells can be assessed by polypeptide of the present invention.

Particularly, the following protocol is used to assess neuronal activity in PC12 cell lines. PC12 cells (rat pheochromocytoma cells) are known to proliferate and/or differentiate by activation with a number of mitogens, such as TPA (tetradecanoyl phorbol acetate), NGF (nerve growth factor), and EGF (epidermal growth factor). The EGR1 gene expression is activated during this treatment. Thus, by stably transfecting PC12 cells with a construct containing an EGR promoter linked to SEAP reporter, activation of PC12 cells by polypeptide of the present invention can be assessed.

The EGR/SEAP reporter construct can be assembled by the following protocol. The EGR-1 promoter sequence (-633 to +1)(Sakamoto K et al., Oncogene 6:867-871 (1991)) can be PCR amplified from human genomic DNA using the following primers:

5' GCGCTCGAGGGATGACAGCGATAGAACCCCGG -3' (SEQ ID NO: 8560)

5' GCGAAGCTTCGCGACTCCCCGGATCCGCCTC-3' (SEQ ID NO: 8561)

Using the GAS:SEAP/Neo vector produced in Example 32, EGR1 amplified product can then be inserted into this vector. Linearize the GAS:SEAP/Neo vector using restriction enzymes XhoI/HindIII, removing the GAS/SV40 stuffer. Restrict the EGR1 amplified

product with these same enzymes. Ligate the vector and the EGR1 promoter.

To prepare 96 well-plates for cell culture, two mls of a coating solution (1:30 dilution of collagen type I (Upstate Biotech Inc. Cat#08-115) in 30% ethanol (filter sterilized)) is added per one 10 cm plate or 50 ml per well of the 96-well plate, and allowed to air dry for 2
5 hr.

PC12 cells are routinely grown in RPMI-1640 medium (Bio Whittaker) containing 10% horse serum (JRH BIOSCIENCES, Cat. # 12449-78P), 5% heat-inactivated fetal bovine serum (FBS) supplemented with 100 units/ml penicillin and 100 ug/ml streptomycin on a precoated 10 cm tissue culture dish. One to four split is done every three to four days. Cells
10 are removed from the plates by scraping and resuspended with pipetting up and down for more than 15 times.

Transfect the EGR/SEAP/Neo construct into PC12 using the Lipofectamine protocol described in Example 31. EGR-SEAP/PC12 stable cells are obtained by growing the cells in 300 ug/ml G418. The G418-free medium is used for routine growth but every one to two
15 months, the cells should be re-grown in 300 ug/ml G418 for couple of passages.

To assay for neuronal activity, a 10 cm plate with cells around 70 to 80% confluent is screened by removing the old medium. Wash the cells once with PBS (Phosphate buffered saline). Then starve the cells in low serum medium (RPMI-1640 containing 1% horse serum and 0.5% FBS with antibiotics) overnight.

20 The next morning, remove the medium and wash the cells with PBS. Scrape off the cells from the plate, suspend the cells well in 2 ml low serum medium. Count the cell number and add more low serum medium to reach final cell density as 5×10^5 cells/ml.

Add 200 ul of the cell suspension to each well of 96-well plate (equivalent to 1×10^5 cells/well). Add 50 ul supernatant produced by Example 31, 37 degree C for 48 to 72 hr. As
25 a positive control, a growth factor known to activate PC12 cells through EGR can be used, such as 50 ng/ul of Neuronal Growth Factor (NGF). Over fifty-fold induction of SEAP is typically seen in the positive control wells. SEAP assay the supernatant according to Example 37.

30 ***Example 36: High-Throughput Screening Assay for T-cell Activity.***

NF-KB (Nuclear Factor KB) is a transcription factor activated by a wide variety of

agents including the inflammatory cytokines IL-1 and TNF, CD30 and CD40, lymphotoxin-alpha and lymphotoxin-beta, by exposure to LPS or thrombin, and by expression of certain viral gene products. As a transcription factor, NF-KB regulates the expression of genes involved in immune cell activation, control of apoptosis (NF-KB appears to shield cells from apoptosis), B and T-cell development, anti-viral and antimicrobial responses, and multiple stress responses.

In non-stimulated conditions, NF-KB is retained in the cytoplasm with I-KB (Inhibitor KB). However, upon stimulation, I-KB is phosphorylated and degraded, causing NF-KB to shuttle to the nucleus, thereby activating transcription of target genes. Target genes activated by NF-KB include IL-2, IL-6, GM-CSF, ICAM-1 and class 1 MHC.

Due to its central role and ability to respond to a range of stimuli, reporter constructs utilizing the NF-KB promoter element are used to screen the supernatants produced in Example 31. Activators or inhibitors of NF-KB would be useful in treating, preventing, and/or diagnosing diseases. For example, inhibitors of NF-KB could be used to treat those diseases related to the acute or chronic activation of NF-KB, such as rheumatoid arthritis.

To construct a vector containing the NF-KB promoter element, a PCR based strategy is employed. The upstream primer contains four tandem copies of the NF-KB binding site (GGGGACTTTCCC) (SEQ ID NO:8562), 18 bp of sequence complementary to the 5' end of the SV40 early promoter sequence, and is flanked with an XhoI site:

5':GCGGCCTCGAGGGGACTTTCCCGGGGACTTTCCGGGGACTTTCCGGGACTTTC
CATCCTGCCATCTCAATTAG:3' (SEQ ID NO:8563)

The downstream primer is complementary to the 3' end of the SV40 promoter and is flanked with a Hind III site:

5':GCGGCAAGCTTTTGGCAAAGCCTAGGC:3' (SEQ ID NO:8558)

PCR amplification is performed using the SV40 promoter template present in the pB-gal:promoter plasmid obtained from Clontech. The resulting PCR fragment is digested with XhoI and Hind III and subcloned into BLSK2-. (Stratagene) Sequencing with the T7 and T3 primers confirms the insert contains the following sequence:

5':CTCGAGGGGACTTTCCCGGGGACTTTCCGGGGACTTTCCGGGACTTTCCATCTG
CCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCCTAACTCCGCCCATCCCGCCC
CTAACTCCGCCCAGTTCCGCCCATTTCTCCGCCCATGGCTGACTAATTTTTTTTAT
TTATGCAGAGGCCGAGGCCGCTCGGCCTCTGAGCTATTCCAGAAGTAGTGAGG

AGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAAAGCTT:3' (SEQ ID NO:8564)

Next, replace the SV40 minimal promoter element present in the pSEAP2-promoter plasmid (Clontech) with this NF-KB/SV40 fragment using XhoI and HindIII. However, this vector does not contain a neomycin resistance gene, and therefore, is not preferred for mammalian expression systems.

In order to generate stable mammalian cell lines, the NF-KB/SV40/SEAP cassette is removed from the above NF-KB/SEAP vector using restriction enzymes SalI and NotI, and inserted into a vector containing neomycin resistance. Particularly, the NF-KB/SV40/SEAP cassette was inserted into pGFP-1 (Clontech), replacing the GFP gene, after restricting pGFP-1 with SalI and NotI.

Once NF-KB/SV40/SEAP/Neo vector is created, stable Jurkat T-cells are created and maintained according to the protocol described in Example 33. Similarly, the method for assaying supernatants with these stable Jurkat T-cells is also described in Example 33. As a positive control, exogenous TNF alpha (0.1, 1, 10 ng) is added to wells H9, H10, and H11, with a 5-10 fold activation typically observed.

Example 37: Assay for SEAP Activity.

As a reporter molecule for the assays described in Examples 33-36, SEAP activity is assayed using the Tropix Phospho-light Kit (Cat. BP-400) according to the following general procedure. The Tropix Phospho-light Kit supplies the Dilution, Assay, and Reaction Buffers used below.

Prime a dispenser with the 2.5x Dilution Buffer and dispense 15 ul of 2.5x dilution buffer into Optiplates containing 35 ul of a supernatant. Seal the plates with a plastic sealer and incubate at 65 degree C for 30 min. Separate the Optiplates to avoid uneven heating.

Cool the samples to room temperature for 15 minutes. Empty the dispenser and prime with the Assay Buffer. Add 50 ml Assay Buffer and incubate at room temperature 5 min. Empty the dispenser and prime with the Reaction Buffer (see the table below). Add 50 ul Reaction Buffer and incubate at room temperature for 20 minutes. Since the intensity of the chemiluminescent signal is time dependent, and it takes about 10 minutes to read 5 plates on luminometer, one should treat 5 plates at each time and start the second set 10 minutes later.

Read the relative light unit in the luminometer. Set H12 as blank, and print the

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results. An increase in chemiluminescence indicates reporter activity.

Reaction Buffer Formulation:

| # of plates | Rxn buffer diluent (ml) | CSPD (ml) |
|-------------|-------------------------|-----------|
| 10 | 60 | 3 |
| 11 | 65 | 3.25 |
| 12 | 70 | 3.5 |
| 13 | 75 | 3.75 |
| 14 | 80 | 4 |
| 15 | 85 | 4.25 |
| 16 | 90 | 4.5 |
| 17 | 95 | 4.75 |
| 18 | 100 | 5 |
| 19 | 105 | 5.25 |
| 20 | 110 | 5.5 |
| 21 | 115 | 5.75 |
| 22 | 120 | 6 |
| 23 | 125 | 6.25 |
| 24 | 130 | 6.5 |
| 25 | 135 | 6.75 |
| 26 | 140 | 7 |
| 27 | 145 | 7.25 |
| 28 | 150 | 7.5 |
| 29 | 155 | 7.75 |
| 30 | 160 | 8 |
| 31 | 165 | 8.25 |
| 32 | 170 | 8.5 |
| 33 | 175 | 8.75 |
| 34 | 180 | 9 |
| 35 | 185 | 9.25 |
| 36 | 190 | 9.5 |
| 37 | 195 | 9.75 |
| 38 | 200 | 10 |
| 39 | 205 | 10.25 |
| 40 | 210 | 10.5 |
| 41 | 215 | 10.75 |
| 42 | 220 | 11 |

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| | | |
|----|-----|-------|
| 43 | 225 | 11.25 |
| 44 | 230 | 11.5 |
| 45 | 235 | 11.75 |
| 46 | 240 | 12 |
| 47 | 245 | 12.25 |
| 48 | 250 | 12.5 |
| 49 | 255 | 12.75 |
| 50 | 260 | 13 |

Example 38: High-Throughput Screening Assay Identifying Changes in Small Molecule Concentration and Membrane Permeability.

5

Binding of a ligand to a receptor is known to alter intracellular levels of small molecules, such as calcium, potassium, sodium, and pH, as well as alter membrane potential. These alterations can be measured in an assay to identify supernatants which bind to receptors of a particular cell. Although the following protocol describes an assay for calcium, this protocol can easily be modified to detect changes in potassium, sodium, pH, membrane potential, or any other small molecule which is detectable by a fluorescent probe.

10

The following assay uses Fluorometric Imaging Plate Reader ("FLIPR") to measure changes in fluorescent molecules (Molecular Probes) that bind small molecules. Clearly, any fluorescent molecule detecting a small molecule can be used instead of the calcium fluorescent molecule, fluo-4 (Molecular Probes, Inc.; catalog no. F-14202), used here.

15

For adherent cells, seed the cells at 10,000 -20,000 cells/well in a Co-star black 96-well plate with clear bottom. The plate is incubated in a CO₂ incubator for 20 hours. The adherent cells are washed two times in Biotek washer with 200 ul of HBSS (Hank's Balanced Salt Solution) leaving 100 ul of buffer after the final wash.

20

A stock solution of 1 mg/ml fluo-4 is made in 10% pluronic acid DMSO. To load the cells with fluo-4, 50 ul of 12 ug/ml fluo-4 is added to each well. The plate is incubated at 37 degrees C in a CO₂ incubator for 60 min. The plate is washed four times in the Biotek washer with HBSS leaving 100 ul of buffer.

25

For non-adherent cells, the cells are spun down from culture media. Cells are re-suspended to 2-5x10⁶ cells/ml with HBSS in a 50-ml conical tube. 4 ul of 1 mg/ml fluo-4

solution in 10% pluronic acid DMSO is added to each ml of cell suspension. The tube is then placed in a 37 degrees C water bath for 30-60 min. The cells are washed twice with HBSS, resuspended to 1×10^6 cells/ml, and dispensed into a microplate, 100 ul/well. The plate is centrifuged at 1000 rpm for 5 min. The plate is then washed once in Denley Cell Wash with 200 ul, followed by an aspiration step to 100 ul final volume.

For a non-cell based assay, each well contains a fluorescent molecule, such as fluo-4 . The supernatant is added to the well, and a change in fluorescence is detected.

To measure the fluorescence of intracellular calcium, the FLIPR is set for the following parameters: (1) System gain is 300-800 mW; (2) Exposure time is 0.4 second; (3) Camera F/stop is F/2; (4) Excitation is 488 nm; (5) Emission is 530 nm; and (6) Sample addition is 50 ul. Increased emission at 530 nm indicates an extracellular signaling event caused by the a molecule, either polypeptide of the present invention or a molecule induced by polypeptide of the present invention, which has resulted in an increase in the intracellular Ca^{++} concentration.

Example 40: High-Throughput Screening Assay Identifying Tyrosine Kinase Activity.

The Protein Tyrosine Kinases (PTK) represent a diverse group of transmembrane and cytoplasmic kinases. Within the Receptor Protein Tyrosine Kinase (RPTK) group are receptors for a range of mitogenic and metabolic growth factors including the PDGF, FGF, EGF, NGF, HGF and Insulin receptor subfamilies. In addition there are a large family of RPTKs for which the corresponding ligand is unknown. Ligands for RPTKs include mainly secreted small proteins, but also membrane-bound and extracellular matrix proteins.

Activation of RPTK by ligands involves ligand-mediated receptor dimerization, resulting in transphosphorylation of the receptor subunits and activation of the cytoplasmic tyrosine kinases. The cytoplasmic tyrosine kinases include receptor associated tyrosine kinases of the src-family (e.g., src, yes, lck, lyn, fyn) and non-receptor linked and cytosolic protein tyrosine kinases, such as the Jak family, members of which mediate signal transduction triggered by the cytokine superfamily of receptors (e.g., the Interleukins, Interferons, GM-CSF, and Leptin).

Because of the wide range of known factors capable of stimulating tyrosine kinase

activity, identifying whether polypeptide of the present invention or a molecule induced by polypeptide of the present invention is capable of activating tyrosine kinase signal transduction pathways is of interest. Therefore, the following protocol is designed to identify such molecules capable of activating the tyrosine kinase signal transduction pathways.

5 Seed target cells (e.g., primary keratinocytes) at a density of approximately 25,000 cells per well in a 96 well Loprodyne Silent Screen Plates purchased from Nalge Nunc (Naperville, IL). The plates are sterilized with two 30 minute rinses with 100% ethanol, rinsed with water and dried overnight. Some plates are coated for 2 hr with 100 ml of cell culture grade type I collagen (50 mg/ml), gelatin (2%) or polylysine (50 mg/ml), all of which
10 can be purchased from Sigma Chemicals (St. Louis, MO) or 10% Matrigel purchased from Becton Dickinson (Bedford,MA), or calf serum, rinsed with PBS and stored at 4 degree C. Cell growth on these plates is assayed by seeding 5,000 cells/well in growth medium and indirect quantitation of cell number through use of alamarBlue as described by the manufacturer Alamar Biosciences, Inc. (Sacramento, CA) after 48 hr. Falcon plate covers
15 #3071 from Becton Dickinson (Bedford,MA) are used to cover the Loprodyne Silent Screen Plates. Falcon Microtest III cell culture plates can also be used in some proliferation experiments.

To prepare extracts, A431 cells are seeded onto the nylon membranes of Loprodyne plates (20,000/200ml/well) and cultured overnight in complete medium. Cells are quiesced
20 by incubation in serum-free basal medium for 24 hr. After 5-20 minutes treatment with EGF (60ng/ml) or 50 ul of the supernatant produced in Example 31, the medium was removed and 100 ml of extraction buffer ((20 mM HEPES pH 7.5, 0.15 M NaCl, 1% Triton X-100, 0.1% SDS, 2 mM Na₃VO₄, 2 mM Na₄P₂O₇ and a cocktail of protease inhibitors (# 1836170) obtained from Boehringer Mannheim (Indianapolis, IN) is added to each well and the plate
25 is shaken on a rotating shaker for 5 minutes at 4°C. The plate is then placed in a vacuum transfer manifold and the extract filtered through the 0.45 mm membrane bottoms of each well using house vacuum. Extracts are collected in a 96-well catch/assay plate in the bottom of the vacuum manifold and immediately placed on ice. To obtain extracts clarified by centrifugation, the content of each well, after detergent solubilization for 5 minutes, is
30 removed and centrifuged for 15 minutes at 4 degree C at 16,000 x g.

Test the filtered extracts for levels of tyrosine kinase activity. Although many methods of detecting tyrosine kinase activity are known, one method is described here.

Generally, the tyrosine kinase activity of a supernatant is evaluated by determining its ability to phosphorylate a tyrosine residue on a specific substrate (a biotinylated peptide). Biotinylated peptides that can be used for this purpose include PSK1 (corresponding to amino acids 6-20 of the cell division kinase cdc2-p34) and PSK2 (corresponding to amino acids 1-17 of gastrin). Both peptides are substrates for a range of tyrosine kinases and are available from Boehringer Mannheim.

The tyrosine kinase reaction is set up by adding the following components in order. First, add 10ul of 5uM Biotinylated Peptide, then 10ul ATP/Mg²⁺ (5mM ATP/50mM MgCl₂), then 10ul of 5x Assay Buffer (40mM imidazole hydrochloride, pH7.3, 40 mM beta-glycerophosphate, 1mM EGTA, 100mM MgCl₂, 5 mM MnCl₂, 0.5 mg/ml BSA), then 5ul of Sodium Vanadate(1mM), and then 5ul of water. Mix the components gently and preincubate the reaction mix at 30 degree C for 2 min. Initiate the reaction by adding 10ul of the control enzyme or the filtered supernatant.

The tyrosine kinase assay reaction is then terminated by adding 10 ul of 120mM EDTA and place the reactions on ice.

Tyrosine kinase activity is determined by transferring 50 ul aliquot of reaction mixture to a microtiter plate (MTP) module and incubating at 37 degree C for 20 min. This allows the streptavidin coated 96 well plate to associate with the biotinylated peptide. Wash the MTP module with 300ul/well of PBS four times. Next add 75 ul of anti-phosphotyrosine antibody conjugated to horse radish peroxidase(anti-P-Tyr-POD(0.5u/ml)) to each well and incubate at 37 degree C for one hour. Wash the well as above.

Next add 100ul of peroxidase substrate solution (Boehringer Mannheim) and incubate at room temperature for at least 5 mins (up to 30 min). Measure the absorbance of the sample at 405 nm by using ELISA reader. The level of bound peroxidase activity is quantitated using an ELISA reader and reflects the level of tyrosine kinase activity.

Example 41: High-Throughput Screening Assay Identifying Phosphorylation Activity.

As a potential alternative and/or complement to the assay of protein tyrosine kinase activity described in Example 40, an assay which detects activation (phosphorylation) of major intracellular signal transduction intermediates can also be used. For example, as

described below one particular assay can detect tyrosine phosphorylation of the Erk-1 and Erk-2 kinases. However, phosphorylation of other molecules, such as Raf, JNK, p38 MAP, Map kinase kinase (MEK), MEK kinase, Src, Muscle specific kinase (MuSK), IRAK, Tec, and Janus, as well as any other phosphoserine, phosphotyrosine, or phosphothreonine molecule, can be detected by substituting these molecules for Erk-1 or Erk-2 in the following assay.

Specifically, assay plates are made by coating the wells of a 96-well ELISA plate with 0.1ml of protein G (1ug/ml) for 2 hr at room temp, (RT). The plates are then rinsed with PBS and blocked with 3% BSA/PBS for 1 hr at RT. The protein G plates are then treated with 2 commercial monoclonal antibodies (100ng/well) against Erk-1 and Erk-2 (1 hr at RT) (Santa Cruz Biotechnology). (To detect other molecules, this step can easily be modified by substituting a monoclonal antibody detecting any of the above described molecules.) After 3-5 rinses with PBS, the plates are stored at 4 degree C until use.

A431 cells are seeded at 20,000/well in a 96-well Loprodyne filterplate and cultured overnight in growth medium. The cells are then starved for 48 hr in basal medium (DMEM) and then treated with EGF (6ng/well) or 50 ul of the supernatants obtained in Example 31 for 5-20 minutes. The cells are then solubilized and extracts filtered directly into the assay plate.

After incubation with the extract for 1 hr at RT, the wells are again rinsed. As a positive control, a commercial preparation of MAP kinase (10ng/well) is used in place of A431 extract. Plates are then treated with a commercial polyclonal (rabbit) antibody (1ug/ml) which specifically recognizes the phosphorylated epitope of the Erk-1 and Erk-2 kinases (1 hr at RT). This antibody is biotinylated by standard procedures. The bound polyclonal antibody is then quantitated by successive incubations with Europium-streptavidin and Europium fluorescence enhancing reagent in the Wallac DELFIA instrument (time-resolved fluorescence). An increased fluorescent signal over background indicates a phosphorylation by polypeptide of the present invention or a molecule induced by polypeptide of the present invention.

Example 42: Assay for the Stimulation of Bone Marrow CD34+ Cell Proliferation.

This assay is based on the ability of human CD34+ to proliferate in the presence of

hematopoietic growth factors and evaluates the ability of isolated polypeptides expressed in mammalian cells to stimulate proliferation of CD34+ cells.

It has been previously shown that most mature precursors will respond to only a single signal. More immature precursors require at least two signals to respond. Therefore, to test the effect of polypeptides on hematopoietic activity of a wide range of progenitor cells, the assay contains a given polypeptide in the presence or absence of other hematopoietic growth factors. Isolated cells are cultured for 5 days in the presence of Stem Cell Factor (SCF) in combination with tested sample. SCF alone has a very limited effect on the proliferation of bone marrow (BM) cells, acting in such conditions only as a "survival" factor. However, combined with any factor exhibiting stimulatory effect on these cells (e.g., IL-3), SCF will cause a synergistic effect. Therefore, if the tested polypeptide has a stimulatory effect on a hematopoietic progenitors, such activity can be easily detected. Since normal BM cells have a low level of cycling cells, it is likely that any inhibitory effect of a given polypeptide, or agonists or antagonists thereof, might not be detected. Accordingly, assays for an inhibitory effect on progenitors is preferably tested in cells that are first subjected to *in vitro* stimulation with SCF+IL+3, and then contacted with the compound that is being evaluated for inhibition of such induced proliferation.

Briefly, CD34+ cells are isolated using methods known in the art. The cells are thawed and resuspended in medium (QBSF 60 serum-free medium with 1% L-glutamine (500ml) Quality Biological, Inc., Gaithersburg, MD Cat# 160-204-101). After several gentle centrifugation steps at 200 x g, cells are allowed to rest for one hour. The cell count is adjusted to 2.5×10^5 cells/ml. During this time, 100 μ l of sterile water is added to the peripheral wells of a 96-well plate. The cytokines that can be tested with a given polypeptide in this assay is rhSCF (R&D Systems, Minneapolis, MN, Cat# 255-SC) at 50 ng/ml alone and in combination with rhSCF and rhIL-3 (R&D Systems, Minneapolis, MN, Cat# 203-ML) at 30 ng/ml. After one hour, 10 μ l of prepared cytokines, 50 μ l of the supernatants prepared in Example 31 (supernatants at 1:2 dilution = 50 μ l) and 20 μ l of diluted cells are added to the media which is already present in the wells to allow for a final total volume of 100 μ l. The plates are then placed in a 37°C/5% CO₂ incubator for five days.

Eighteen hours before the assay is harvested, 0.5 μ Ci/well of [3H] Thymidine is added in a 10 μ l volume to each well to determine the proliferation rate. The experiment is terminated by harvesting the cells from each 96-well plate to a filtermat using the Tomtec

Harvester 96. After harvesting, the filtermats are dried, trimmed and placed into OmniFilter assemblies consisting of one OmniFilter plate and one OmniFilter Tray. 60 µl Microscint is added to each well and the plate sealed with TopSeal-A press-on sealing film. A bar code 15 sticker is affixed to the first plate for counting. The sealed plates is then loaded and the level of radioactivity determined via the Packard Top Count and the printed data collected for analysis. The level of radioactivity reflects the amount of cell proliferation.

The studies described in this example test the activity of a given polypeptide to stimulate bone marrow CD34+ cell proliferation. One skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or antagonists and fragments and variants thereof. As a nonlimiting example, potential antagonists tested in this assay would be expected to inhibit cell proliferation in the presence of cytokines and/or to increase the inhibition of cell proliferation in the presence of cytokines and a given polypeptide. In contrast, potential agonists tested in this assay would be expected to enhance cell proliferation and/or to decrease the inhibition of cell proliferation in the presence of cytokines and a given polypeptide.

The ability of a gene to stimulate the proliferation of bone marrow CD34+ cells indicates that polynucleotides and polypeptides corresponding to the gene are useful for the diagnosis and treatment of disorders affecting the immune system and hematopoiesis. Representative uses are described in the "Immune Activity" and "Infectious Disease" sections above, and elsewhere herein.

Example 43: Assay for Extracellular Matrix Enhanced Cell Response (EMECCR).

The objective of the Extracellular Matrix Enhanced Cell Response (EMECCR) assay is to identify gene products (e.g., isolated polypeptides) that act on the hematopoietic stem cells in the context of the extracellular matrix (ECM) induced signal.

Cells respond to the regulatory factors in the context of signal(s) received from the surrounding microenvironment. For example, fibroblasts, and endothelial and epithelial stem cells fail to replicate in the absence of signals from the ECM. Hematopoietic stem cells can undergo self-renewal in the bone marrow, but not in *in vitro* suspension culture. The ability of stem cells to undergo self-renewal *in vitro* is dependent upon their interaction with the

stromal cells and the ECM protein fibronectin (fn). Adhesion of cells to fn is mediated by the $\alpha_5\beta_1$ and $\alpha_4\beta_1$ integrin receptors, which are expressed by human and mouse hematopoietic stem cells. The factor(s) which integrate with the ECM environment and responsible for stimulating stem cell self-renewal has not yet been identified. Discovery of such factors should be of great interest in gene therapy and bone marrow transplant applications

Briefly, polystyrene, non tissue culture treated, 96-well plates are coated with fn fragment at a coating concentration of $0.2 \mu\text{g}/\text{cm}^2$. Mouse bone marrow cells are plated (1,000 cells/well) in 0.2 ml of serum-free medium. Cells cultured in the presence of IL-3 (5 ng/ml) + SCF (50 ng/ml) would serve as the positive control, conditions under which little self-renewal but pronounced differentiation of the stem cells is to be expected. Gene products of the invention (e.g., including, but not limited to, polynucleotides and polypeptides of the present invention, and supernatants produced in Example 31), are tested with appropriate negative controls in the presence and absence of SCF(5.0 ng/ml), where test factor supernates represent 10% of the total assay volume. The plated cells are then allowed to grow by incubating in a low oxygen environment (5% CO_2 , 7% O_2 , and 88% N_2) tissue culture incubator for 7 days. The number of proliferating cells within the wells is then quantitated by measuring thymidine incorporation into cellular DNA. Verification of the positive hits in the assay will require phenotypic characterization of the cells, which can be accomplished by scaling up of the culture system and using appropriate antibody reagents against cell surface antigens and FACScan.

One skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or antagonists and fragments and variants thereof.

If a particular polypeptide of the present invention is found to be a stimulator of hematopoietic progenitors, polynucleotides and polypeptides corresponding to the gene encoding said polypeptide may be useful for the diagnosis and treatment of disorders affecting the immune system and hematopoiesis. Representative uses are described in the "Immune Activity" and "Infectious Disease" sections above, and elsewhere herein. The gene product may also be useful in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types.

Additionally, the polynucleotides and/or polypeptides of the gene of interest and/or

agonists and/or antagonists thereof, may also be employed to inhibit the proliferation and differentiation of hematopoietic cells and therefore may be employed to protect bone marrow stem cells from chemotherapeutic agents during chemotherapy. This antiproliferative effect may allow administration of higher doses of chemotherapeutic agents and, therefore, more effective chemotherapeutic treatment.

Moreover, polynucleotides and polypeptides corresponding to the gene of interest may also be useful for the treatment and diagnosis of hematopoietic related disorders such as, for example, anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia.

Example 44: Human Dermal Fibroblast and Aortic Smooth Muscle Cell Proliferation.

The polypeptide of interest is added to cultures of normal human dermal fibroblasts (NHDF) and human aortic smooth muscle cells (AoSMC) and two co-assays are performed with each sample. The first assay examines the effect of the polypeptide of interest on the proliferation of normal human dermal fibroblasts (NHDF) or aortic smooth muscle cells (AoSMC). Aberrant growth of fibroblasts or smooth muscle cells is a part of several pathological processes, including fibrosis, and restenosis. The second assay examines IL6 production by both NHDF and SMC. IL6 production is an indication of functional activation. Activated cells will have increased production of a number of cytokines and other factors, which can result in a proinflammatory or immunomodulatory outcome. Assays are run with and without co-TNF α stimulation, in order to check for costimulatory or inhibitory activity.

Briefly, on day 1, 96-well black plates are set up with 1000 cells/well (NHDF) or 2000 cells/well (AoSMC) in 100 μ l culture media. NHDF culture media contains: Clonetics FB basal media, 1mg/ml hFGF, 5mg/ml insulin, 50mg/ml gentamycin, 2%FBS, while AoSMC culture media contains Clonetics SM basal media, 0.5 μ g/ml hEGF, 5mg/ml insulin, 1 μ g/ml hFGF, 50mg/ml gentamycin, 50 μ g/ml Amphotericin B, 5%FBS. After incubation at 37°C for at least 4-5 hours, culture media is aspirated and replaced with growth arrest media. Growth arrest media for NHDF contains fibroblast basal media, 50mg/ml gentamycin, 2%

FBS, while growth arrest media for AoSMC contains SM basal media, 50mg/ml gentamycin, 50µg/ml Amphotericin B, 0.4% FBS. Incubate at 37°C until day 2.

On day 2, serial dilutions and templates of the polypeptide of interest are designed such that they always include media controls and known-protein controls. For both
5 stimulation and inhibition experiments, proteins are diluted in growth arrest media. For inhibition experiments, TNFa is added to a final concentration of 2ng/ml (NHDF) or 5ng/ml (AoSMC). Add 1/3 vol media containing controls or polypeptides of the present invention and incubate at 37°C/5% CO₂ until day 5.

Transfer 60µl from each well to another labeled 96-well plate, cover with a plate-
10 sealer, and store at 4°C until Day 6 (for IL6 ELISA). To the remaining 100 µl in the cell culture plate, aseptically add Alamar Blue in an amount equal to 10% of the culture volume (10µl). Return plates to incubator for 3 to 4 hours. Then measure fluorescence with excitation at 530nm and emission at 590nm using the CytoFluor. This yields the growth stimulation/inhibition data.

15 On day 5, the IL6 ELISA is performed by coating a 96 well plate with 50-100 ul/well of Anti-Human IL6 Monoclonal antibody diluted in PBS, pH 7.4, incubate ON at room temperature.

On day 6, empty the plates into the sink and blot on paper towels. Prepare Assay
Buffer containing PBS with 4% BSA. Block the plates with 200 µl/well of Pierce Super
20 Block blocking buffer in PBS for 1-2 hr and then wash plates with wash buffer (PBS, 0.05% Tween-20). Blot plates on paper towels. Then add 50 µl/well of diluted Anti-Human IL-6 Monoclonal, Biotin-labeled antibody at 0.50 mg/ml. Make dilutions of IL-6 stock in media (30, 10, 3, 1, 0.3, 0 ng/ml). Add duplicate samples to top row of plate. Cover the plates and incubate for 2 hours at RT on shaker. Plates are washed with wash buffer and blotted on
25 paper towels. Dilute EU-labeled Streptavidin 1:1000 in Assay buffer, and add 100 µl/well. Cover the plate and incubate 1 h at RT. Plates are again washed with wash buffer and blotted on paper towels. Add 100 µl/well of Enhancement Solution and shake for 5 minutes. Read the plate on the Wallac DELFIA Fluorometer. Readings from triplicate samples in each assay are tabulated and averaged.

30 A positive result in this assay suggests AoSMC cell proliferation and that the polypeptide of the present invention may be involved in dermal fibroblast proliferation and/or smooth muscle cell proliferation. A positive result also suggests many potential uses of

polypeptides, polynucleotides, agonists and/or antagonists of the polynucleotide/polypeptide of the present invention which gives a positive result. For example, inflammation and immune responses, wound healing, and angiogenesis, as detailed throughout this specification. Particularly, polypeptides of the present invention and polynucleotides of the present invention may be used in wound healing and dermal regeneration, as well as the promotion of vasculargenesis, both of the blood vessels and lymphatics. The growth of vessels can be used in the treatment of, for example, cardiovascular diseases. Additionally, antagonists of polypeptides and polynucleotides of the invention may be useful in treating diseases, disorders, and/or conditions which involve angiogenesis by acting as an anti-vascular (e.g., anti-angiogenesis). These diseases, disorders, and/or conditions are known in the art and/or are described herein, such as, for example, malignancies, solid tumors, benign tumors, for example hemangiomas, acoustic neuromas, neurofibromas, trachomas, and pyogenic granulomas; arteriosclerotic plaques; ocular angiogenic diseases, for example, diabetic retinopathy, retinopathy of prematurity, macular degeneration, corneal graft rejection, neovascular glaucoma, retrolental fibroplasia, rubeosis, retinoblastoma, uveitis and Pterygia (abnormal blood vessel growth) of the eye; rheumatoid arthritis; psoriasis; delayed wound healing; endometriosis; vasculogenesis; granulations; hypertrophic scars (keloids); nonunion fractures; scleroderma; trachoma; vascular adhesions; myocardial angiogenesis; coronary collaterals; cerebral collaterals; arteriovenous malformations; ischemic limb angiogenesis; Osler-Webber Syndrome; plaque neovascularization; telangiectasia; hemophiliac joints; angiofibroma; fibromuscular dysplasia; wound granulation; Crohn's disease; and atherosclerosis. Moreover, antagonists of polypeptides and polynucleotides of the invention may be useful in treating anti-hyperproliferative diseases and/or anti-inflammatory known in the art and/or described herein.

One skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or antagonists and fragments and variants thereof.

Example 45: Cellular Adhesion Molecule (CAM) Expression on Endothelial Cells.

The recruitment of lymphocytes to areas of inflammation and angiogenesis involves specific receptor-ligand interactions between cell surface adhesion molecules (CAMs) on lymphocytes and the vascular endothelium. The adhesion process, in both normal and pathological settings, follows a multi-step cascade that involves intercellular adhesion molecule-1 (ICAM-1), vascular cell adhesion molecule-1 (VCAM-1), and endothelial leukocyte adhesion molecule-1 (E-selectin) expression on endothelial cells (EC). The expression of these molecules and others on the vascular endothelium determines the efficiency with which leukocytes may adhere to the local vasculature and extravasate into the local tissue during the development of an inflammatory response. The local concentration of cytokines and growth factor participate in the modulation of the expression of these CAMs.

Briefly, endothelial cells (e.g., Human Umbilical Vein Endothelial cells (HUVECs)) are grown in a standard 96 well plate to confluence, growth medium is removed from the cells and replaced with 100 μ l of 199 Medium (10% fetal bovine serum (FBS)). Samples for testing and positive or negative controls are added to the plate in triplicate (in 10 μ l volumes). Plates are then incubated at 37°C for either 5 h (selectin and integrin expression) or 24 h (integrin expression only). Plates are aspirated to remove medium and 100 μ l of 0.1% paraformaldehyde-PBS(with Ca⁺⁺ and Mg⁺⁺) is added to each well. Plates are held at 4°C for 30 min. Fixative is removed from the wells and wells are washed 1X with PBS(+Ca,Mg) + 0.5% BSA and drained. 10 μ l of diluted primary antibody is added to the test and control wells. Anti-ICAM-1-Biotin, Anti-VCAM-1-Biotin and Anti-E-selectin-Biotin are used at a concentration of 10 μ g/ml (1:10 dilution of 0.1 mg/ml stock antibody). Cells are incubated at 37°C for 30 min. in a humidified environment. Wells are washed three times with PBS(+Ca,Mg) + 0.5% BSA. 20 μ l of diluted ExtrAvidin-Alkaline Phosphatase (1:5,000 dilution, referred to herein as the working dilution) are added to each well and incubated at 37°C for 30 min. Wells are washed three times with PBS(+Ca,Mg)+0.5% BSA. Dissolve 1 tablet of p-Nitrophenol Phosphate pNPP per 5 ml of glycine buffer (pH 10.4). 100 μ l of pNPP substrate in glycine buffer is added to each test well. Standard wells in triplicate are prepared from the working dilution of the ExtrAvidin-Alkaline Phosphatase in glycine buffer: 1:5,000 (10^0) > $10^{-0.5}$ > 10^{-1} > $10^{-1.5}$. 5 μ l of each dilution is added to triplicate wells and the resulting AP content in each well is 5.50 ng, 1.74 ng, 0.55 ng, 0.18 ng. 100 μ l of pNPP reagent is then added to each of the standard wells. The plate is incubated at 37°C for 4h. A volume of 50 μ l of 3M NaOH is added to all wells. The plate is read on a plate reader

at 405 nm using the background subtraction option on blank wells filled with glycine buffer only. Additionally, the template is set up to indicate the concentration of AP-conjugate in each standard well [5.50 ng; 1.74 ng; 0.55 ng; 0.18 ng]. Results are indicated as amount of bound AP-conjugate in each sample.

5

Example 46: Alamar Blue Endothelial Cells Proliferation Assay.

This assay may be used to quantitatively determine protein mediated inhibition of bFGF-induced proliferation of Bovine Lymphatic Endothelial Cells (LECs), Bovine Aortic
10 Endothelial Cells (BAECs) or Human Microvascular Uterine Myometrial Cells (UTMECs). This assay incorporates a fluorometric growth indicator based on detection of metabolic activity. A standard Alamar Blue Proliferation Assay is prepared in EGM-2MV with 10 ng /ml of bFGF added as a source of endothelial cell stimulation. This assay may be used with a variety of endothelial cells with slight changes in growth medium and cell concentration.
15 Dilutions of the protein batches to be tested are diluted as appropriate. Serum-free medium (GIBCO SFM) without bFGF is used as a non-stimulated control and Angiostatin or TSP-1 are included as a known inhibitory controls.

Briefly, LEC, BAECs or UTMECs are seeded in growth media at a density of 5000 to 2000 cells/well in a 96 well plate and placed at 37-C overnight. After the overnight
20 incubation of the cells, the growth media is removed and replaced with GIBCO EC-SFM. The cells are treated with the appropriate dilutions of the protein of interest or control protein sample(s) (prepared in SFM) in triplicate wells with additional bFGF to a concentration of 10 ng/ ml. Once the cells have been treated with the samples, the plate(s) is/are placed back in the 37° C incubator for three days. After three days 10 ml of stock alamar blue (Biosource
25 Cat# DAL1100) is added to each well and the plate(s) is/are placed back in the 37°C incubator for four hours. The plate(s) are then read at 530nm excitation and 590nm emission using the CytoFluor fluorescence reader. Direct output is recorded in relative fluorescence units.

Alamar blue is an oxidation-reduction indicator that both fluoresces and changes color
30 in response to chemical reduction of growth medium resulting from cell growth. As cells grow in culture, innate metabolic activity results in a chemical reduction of the immediate surrounding environment. Reduction related to growth causes the indicator to change from

oxidized (non-fluorescent blue) form to reduced (fluorescent red) form. i.e. stimulated proliferation will produce a stronger signal and inhibited proliferation will produce a weaker signal and the total signal is proportional to the total number of cells as well as their metabolic activity. The background level of activity is observed with the starvation medium alone. This is compared to the output observed from the positive control samples (bFGF in growth medium) and protein dilutions.

Example 47: Detection of Inhibition of a Mixed Lymphocyte Reaction.

This assay can be used to detect and evaluate inhibition of a Mixed Lymphocyte Reaction (MLR) by gene products (e.g., isolated polypeptides). Inhibition of a MLR may be due to a direct effect on cell proliferation and viability, modulation of costimulatory molecules on interacting cells, modulation of adhesiveness between lymphocytes and accessory cells, or modulation of cytokine production by accessory cells. Multiple cells may be targeted by these polypeptides since the peripheral blood mononuclear fraction used in this assay includes T, B and natural killer lymphocytes, as well as monocytes and dendritic cells.

Polypeptides of interest found to inhibit the MLR may find application in diseases associated with lymphocyte and monocyte activation or proliferation. These include, but are not limited to, diseases such as asthma, arthritis, diabetes, inflammatory skin conditions, psoriasis, eczema, systemic lupus erythematosus, multiple sclerosis, glomerulonephritis, inflammatory bowel disease, crohn's disease, ulcerative colitis, arteriosclerosis, cirrhosis, graft vs. host disease, host vs. graft disease, hepatitis, leukemia and lymphoma.

Briefly, PBMCs from human donors are purified by density gradient centrifugation using Lymphocyte Separation Medium (LSM[®], density 1.0770 g/ml, Organon Teknika Corporation, West Chester, PA). PBMCs from two donors are adjusted to 2×10^6 cells/ml in RPMI-1640 (Life Technologies, Grand Island, NY) supplemented with 10% FCS and 2 mM glutamine. PBMCs from a third donor is adjusted to 2×10^5 cells/ml. Fifty microliters of PBMCs from each donor is added to wells of a 96-well round bottom microtiter plate. Dilutions of test materials (50 μ l) is added in triplicate to microtiter wells. Test samples (of the protein of interest) are added for final dilution of 1:4; rhuIL-2 (R&D Systems, Minneapolis, MN, catalog number 202-IL) is added to a final concentration of 1 μ g/ml; anti-CD4 mAb (R&D Systems, clone 34930.11, catalog number MAB379) is added to a final

concentration of 10 µg/ml. Cells are cultured for 7-8 days at 37°C in 5% CO₂, and 1 µCi of [³H] thymidine is added to wells for the last 16 hrs of culture. Cells are harvested and thymidine incorporation determined using a Packard TopCount. Data is expressed as the mean and standard deviation of triplicate determinations.

5 Samples of the protein of interest are screened in separate experiments and compared to the negative control treatment, anti-CD4 mAb, which inhibits proliferation of lymphocytes and the positive control treatment, IL-2 (either as recombinant material or supernatant), which enhances proliferation of lymphocytes.

10 One skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or antagonists and fragments and variants thereof.

Example 48: Assays for Protease Activity.

15 The following assay may be used to assess protease activity of the colon or colon cancer related polypeptides of the invention.

20 Gelatin and casein zymography are performed essentially as described (Heusen et al., *Anal. Biochem.*, 102:196-202 (1980); Wilson et al., *Journal of Urology*, 149:653-658 (1993)). Samples are run on 10% polyacrylamide/0.1% SDS gels containing 1% gelatin or casein, soaked in 2.5% triton at room temperature for 1 hour, and in 0.1M glycine, pH 8.3 at 37°C 5 to 16 hours. After staining in amido black areas of proteolysis appear as clear areas against the blue-black background. Trypsin (Sigma T8642) is used as a positive control.

25 Protease activity is also determined by monitoring the cleavage of n-a-benzoyl-L-arginine ethyl ester (BAEE) (Sigma B-4500. Reactions are set up in (25mM NaPO₄, 1mM EDTA, and 1mM BAEE), pH 7.5. Samples are added and the change in absorbance at 260nm is monitored on the Beckman DU-6 spectrophotometer in the time-drive mode. Trypsin is used as a positive control

30 Additional assays based upon the release of acid-soluble peptides from casein or hemoglobin measured as absorbance at 280 nm or colorimetrically using the Folin method are performed as described in Bergmeyer, et al., *Methods of Enzymatic Analysis*, 5 (1984). Other assays involve the solubilization of chromogenic substrates (Ward, *Applied Science*, 251-317 (1983).

Example 49: Identifying Serine Protease Substrate Specificity.

Methods known in the art or described herein may be used to determine the substrate
5 specificity of the polypeptides of the present invention having serine protease activity. A
preferred method of determining substrate specificity is by the use of positional scanning
synthetic combinatorial libraries as described in GB 2 324 529 (incorporated herein in its
entirety).

Example 50: Ligand Binding Assays.

The following assay may be used to assess ligand binding activity of the colon or
colon cancer related polypeptides of the invention.

Ligand binding assays provide a direct method for ascertaining receptor
15 pharmacology and are adaptable to a high throughput format. The purified ligand for a colon
or colon cancer related polypeptide is radiolabeled to high specific activity (50-2000
Ci/mmol) for binding studies. A determination is then made that the process of radiolabeling
does not diminish the activity of the ligand towards its colon or colon cancer related
polypeptide. Assay conditions for buffers, ions, pH and other modulators such as nucleotides
20 are optimized to establish a workable signal to noise ratio for both membrane and whole cell
colon or colon cancer related polypeptide sources. For these assays, specific colon or colon
cancer related polypeptide binding is defined as total associated radioactivity minus the
radioactivity measured in the presence of an excess of unlabeled competing ligand. Where
possible, more than one competing ligand is used to define residual nonspecific binding.

Example 51: Functional Assay in Xenopus Oocytes.

Capped RNA transcripts from linearized plasmid templates encoding the colon or
colon cancer related antigen cDNAs of the invention are synthesized in vitro with RNA
30 polymerases in accordance with standard procedures. In vitro transcripts are suspended in
water at a final concentration of 0.2 mg/ml. Ovarian lobes are removed from adult female
toads, Stage V defolliculated oocytes are obtained, and RNA transcripts (10 ng/oocyte) are

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injected in a 50 nl bolus using a microinjection apparatus. Two electrode voltage clamps are used to measure the currents from individual *Xenopus oocytes* in response to colon cancer antigen or colon cancer antigen agonist exposure. Recordings are made in Ca²⁺ free Barth's medium at room temperature. The *Xenopus* system can be used to screen
5 known ligands and tissue/cell extracts for activating ligands.

Example 52: Microphysiometric Assays.

Activation of a wide variety of secondary messenger systems results in extrusion of
10 small amounts of acid from a cell. The acid formed is largely as a result of the increased metabolic activity required to fuel the intracellular signaling process. The pH changes in the media surrounding the cell are very small but are detectable by the CYTOSENSOR microphysiometer (Molecular Devices Ltd., Menlo Park, Calif.). The CYTOSENSOR is thus capable of detecting the activation of a colon cancer antigen which is coupled to an energy
15 utilizing intracellular signaling pathway.

Example 53: Extract/Cell Supernatant Screening.

A large number of mammalian receptors exist for which there remains, as yet, no
20 cognate activating ligand (agonist). Thus, active ligands for these receptors may not be included within the ligands banks as identified to date. Accordingly, the colon cancer antigen of the invention can also be functionally screened (using calcium, cAMP, microphysiometer, oocyte electrophysiology, etc., functional screens) against tissue extracts to identify its natural ligands. Extracts that produce positive functional responses can be sequentially
25 subfractionated until an activating ligand is isolated identified.

Example 54: Calcium and cAMP Functional Assays.

Seven transmembrane receptors which are expressed in HEK 293 cells have been
30 shown to be coupled functionally to activation of PLC and calcium mobilization and/or cAMP stimulation or inhibition. Basal calcium levels in the HEK 293 cells in receptor-transfected or vector control cells were observed to be in the normal, 100 nM to 200 nM,

range. HEK 293 cells expressing recombinant receptors are loaded with fura 2 and in a single day >150 selected ligands or tissue/cell extracts are evaluated for agonist induced calcium mobilization. Similarly, HEK 293 cells expressing recombinant receptors are evaluated for the stimulation or inhibition of cAMP production using standard cAMP
5 quantitation assays. Agonists presenting a calcium transient or cAMP fluctuation are tested in vector control cells to determine if the response is unique to the transfected cells expressing receptor.

Example 55: ATP-binding assay.

10 The following assay may be used to assess ATP-binding activity of the colon or colon cancer related polypeptides of the invention.

ATP-binding activity of the colon or colon cancer related polypeptides of the invention may be detected using the ATP-binding assay described in U.S. Patent 5, 858, 719,
15 which is herein incorporated by reference in its entirety. Briefly, ATP-binding to colon or colon cancer related polypeptides of the invention is measured via photoaffinity labeling with 8-azido-ATP in a competition assay. Reaction mixtures containing 1 mg/ml of the ABC transport protein of the present invention are incubated with varying concentrations of ATP, or the non-hydrolyzable ATP analog adenylyl-5'-imidodiphosphate for 10 minutes at 4°C. A
20 mixture of 8-azido-ATP (Sigma Chem. Corp., St. Louis, MO.) plus 8-azido-ATP ($-^{32}\text{P}$ -ATP) (5 mCi/ μmol , ICN, Irvine CA.) is added to a final concentration of 100 μM and 0.5 ml aliquots are placed in the wells of a porcelain spot plate on ice. The plate is irradiated using a short wave 254 nm UV lamp at a distance of 2.5 cm from the plate for two one-minute intervals with a one-minute cooling interval in between. The reaction is stopped by addition
25 of dithiothreitol to a final concentration of 2mM. The incubations are subjected to SDS-PAGE electrophoresis, dried, and autoradiographed. Protein bands corresponding to the particular colon or colon cancer related polypeptides of the invention are excised, and the radioactivity quantified. A decrease in radioactivity with increasing ATP or adenylyl-5'-imidodiphosphate provides a measure of ATP affinity to the colon or colon cancer related
30 polypeptides.

Example 56: Small Molecule**Screening.**

This invention is particularly useful for screening therapeutic compounds by using the colon or colon cancer related polypeptides of the invention, or binding fragments thereof, in any of a variety of drug screening techniques. The polypeptide or fragment employed in such a test may be affixed to a solid support, expressed on a cell surface, free in solution, or located intracellularly. One method of drug screening utilizes eukaryotic or prokaryotic host cells which are stably transformed with recombinant nucleic acids expressing the polypeptide or fragment. Drugs are screened against such transformed cells in competitive binding assays. One may measure, for example, the formulation of complexes between the agent being tested and a colon or colon cancer related polypeptide of the invention.

Thus, the present invention provides methods of screening for drugs or any other agents which affect activities mediated by the colon or colon cancer related polypeptides of the invention. These methods comprise contacting such an agent with a colon or colon cancer related polypeptide of the invention or a fragment thereof and assaying for the presence of a complex between the agent and the colon or colon cancer related polypeptides or a fragment thereof, by methods well known in the art. In such a competitive binding assay, the agents to screen are typically labeled. Following incubation, free agent is separated from that present in bound form, and the amount of free or uncomplexed label is a measure of the ability of a particular agent to bind to the colon or colon cancer related polypeptides of the invention.

Another technique for drug screening provides high throughput screening for compounds having suitable binding affinity to the colon or colon cancer related polypeptides of the invention, and is described in great detail in European Patent Application 84/03564, published on September 13, 1984, which is herein incorporated by reference in its entirety. Briefly stated, large numbers of different small molecule test compounds are synthesized on a solid substrate, such as plastic pins or some other surface. The test compounds are reacted with colon or colon cancer related polypeptides of the invention and washed. Bound colon or colon cancer related polypeptides are then detected by methods well known in the art. Purified colon or colon cancer related polypeptides are coated directly onto plates for use in the aforementioned drug screening techniques. In addition, non-neutralizing antibodies may be used to capture the peptide and immobilize it on the solid support.

This invention also contemplates the use of competitive drug screening assays in which neutralizing antibodies capable of binding colon or colon cancer related polypeptides of the invention specifically compete with a test compound for binding to the colon or colon cancer related polypeptides or fragments thereof. In this manner, the antibodies are used to
5 detect the presence of any peptide which shares one or more antigenic epitopes with a colon or colon cancer related polypeptides.

Example 57: Phosphorylation Assay.

10 In order to assay for phosphorylation activity of the colon or colon cancer related polypeptides of the invention, a phosphorylation assay as described in U.S. Patent 5,958,405 (which is herein incorporated by reference) is utilized. Briefly, phosphorylation activity may be measured by phosphorylation of a protein substrate using gamma-labeled ^{32}P -ATP and quantitation of the incorporated radioactivity using a gamma radioisotope counter. The colon
15 or colon cancer related polypeptides of the invention are incubated with the protein substrate, ^{32}P -ATP, and a kinase buffer. The ^{32}P incorporated into the substrate is then separated from free ^{32}P -ATP by electrophoresis, and the incorporated ^{32}P is counted and compared to a negative control. Radioactivity counts above the negative control are indicative of phosphorylation activity of the colon or colon cancer related polypeptides of the invention.

20
Example 58: Detection of Phosphorylation Activity (Activation) of Colon or Colon Cancer Related Polypeptides of the Invention in the Presence of Colon or Colon Cancer Related Polypeptides Ligands.

25 Methods known in the art or described herein may be used to determine the phosphorylation activity of the colon or colon cancer related polypeptides of the invention. A preferred method of determining phosphorylation activity is by the use of the tyrosine phosphorylation assay as described in US 5,817,471 (incorporated herein by reference).

30
Example 59: Identification Of Signal Transduction Proteins That Interact With Colon or Colon Cancer Related Polypeptides Of The Present Invention.

The inventive purified colon or colon cancer related polypeptides of the invention are research tools for the identification, characterization and purification of additional signal transduction pathway proteins or receptor proteins. Briefly, labeled receptor PTK polypeptide is useful as a reagent for the purification of molecules with which it interacts. In one embodiment of affinity purification, receptor PTK polypeptide is covalently coupled to a chromatography column. Cell-free extract derived from putative target cells, such as carcinoma tissues, is passed over the column, and molecules with appropriate affinity bind to the receptor PTK polypeptides, or specific phosphotyrosine-recognition domains thereof. The receptor PTK polypeptide interacting protein-complex is recovered from the column, dissociated, and the recovered molecule subjected to N-terminal protein sequencing. This amino acid sequence is then used to identify the captured molecule or to design degenerate oligonucleotide probes for cloning the relevant gene from an appropriate cDNA library.

Example 60: IL-6 Bioassay.

To test the proliferative effects of the colon or colon cancer related polypeptides of the invention, the IL-6 Bioassay as described by Marz *et al.* is utilized (*Proc. Natl. Acad. Sci., U.S.A.*, 95:3251-56 (1998), which is herein incorporated by reference). Briefly, IL-6 dependent B9 murine cells are washed three times in IL-6 free medium and plated at a concentration of 5,000 cells per well in 50 μ l, and 50 μ l of the IL-6-like polypeptide is added. After 68 hrs. at 37°C, the number of viable cells is measured by adding the tetrazolium salt thiazolyl blue (MTT) and incubating for a further 4 hrs. at 37°C. B9 cells are lysed by SDS and optical density is measured at 570 nm. Controls containing IL-6 (positive) and no cytokine (negative) are utilized. Enhanced proliferation in the test sample(s) relative to the negative control is indicative of proliferative effects mediated by colon or colon cancer related polypeptides of the invention.

Example 61: Support of Chicken Embryo Neuron Survival.

To test whether sympathetic neuronal cell viability is supported by the colon or colon cancer related polypeptides of the invention, the chicken embryo neuronal survival assay of Senaldi *et al* is utilized (*Proc. Natl. Acad. Sci., U.S.A.*, 96:11458-63 (1998), which is herein

incorporated by reference). Briefly, motor and sympathetic neurons are isolated from chicken embryos, resuspended in L15 medium (with 10% FCS, glucose, sodium selenite, progesterone, conalbumin, putrescine, and insulin; Life Technologies, Rockville, MD.) and Dulbecco's modified Eagles medium [with 10% FCS, glutamine, penicillin, and 25 mM
5 Hepes buffer (pH 7.2); Life Technologies, Rockville, MD.], respectively, and incubated at 37°C in 5% CO₂ in the presence of different concentrations of the inventive purified IL-6-like polypeptide, as well as a negative control lacking any cytokine. After 3 days, neuron survival is determined by evaluation of cellular morphology, and through the use of the colorimetric assay of Mosmann (Mossmann, T., *J. Immunol. Methods*, 65:55-63 (1983)). Enhanced
10 neuronal cell viability as compared to the controls lacking cytokine is indicative of the ability of the inventive purified IL-6-like polypeptide(s) to enhance the survival of neuronal cells.

Example 62: Assay for Phosphatase Activity.

15 The following assay may be used to assess serine/threonine phosphatase (PTPase) activity of the colon or colon cancer related polypeptides of the invention.

In order to assay for serine/threonine phosphatase (PTPase) activity, assays can be utilized which are widely known to those skilled in the art. For example, the serine/threonine phosphatase (PSPase) activity is measured using a PSPase assay kit from New England
20 Biolabs, Inc. Myelin basic protein (MyBP), a substrate for PSPase, is phosphorylated on serine and threonine residues with cAMP-dependent Protein Kinase in the presence of [γ -³²P]ATP. Protein serine/threonine phosphatase activity is then determined by measuring the release of inorganic phosphate from ³²P-labeled MyBP.

Example 63: Interaction of Serine/Threonine Phosphatases with other Proteins.

The colon or colon cancer related polypeptides of the invention with serine/threonine phosphatase activity as determined in Example 62 are research tools for the identification,
30 characterization and purification of additional interacting proteins or receptor proteins, or other signal transduction pathway proteins. Briefly, a labeled colon or colon cancer related polypeptides of the invention is useful as a reagent for the purification of molecules with

which it interacts. In one embodiment of affinity purification, colon or colon cancer related polypeptides of the invention is covalently coupled to a chromatography column. Cell-free extract derived from putative target cells, such as neural or liver cells, is passed over the column, and molecules with appropriate affinity bind to the colon or colon cancer related polypeptides of the invention. The colon or colon cancer related polypeptides of the invention-complex is recovered from the column, dissociated, and the recovered molecule subjected to N-terminal protein sequencing. This amino acid sequence is then used to identify the captured molecule or to design degenerate oligonucleotide probes for cloning the relevant gene from an appropriate cDNA library.

Example 64: Assaying for Heparanase Activity.

In order to assay for heparanase activity of the colon or colon cancer related polypeptides of the invention, the heparanase assay described by Vlodavsky et al is utilized (Vlodavsky, I., et al., Nat. Med., 5:793-802 (1999)). Briefly, cell lysates, conditioned media or intact cells (1×10^6 cells per 35-mm dish) are incubated for 18 hrs at 37°C, pH 6.2-6.6, with ^{35}S -labeled ECM or soluble ECM derived peak I proteoglycans. The incubation medium is centrifuged and the supernatant is analyzed by gel filtration on a Sepharose CL-6B column (0.9 x 30 cm). Fractions are eluted with PBS and their radioactivity is measured. Degradation fragments of heparan sulfate side chains are eluted from Sepharose 6B at $0.5 < K_{av} < 0.8$ (peak II). Each experiment is done at least three times. Degradation fragments corresponding to "peak II," as described by Vlodavsky et al., is indicative of the activity of the colon or colon cancer related polypeptides of the invention in cleaving heparan sulfate.

Example 65: Immobilization of biomolecules.

This method provides a method for the stabilization of colon or colon cancer related polypeptides of the invention in non-host cell lipid bilayer constructs (see, e.g., Bieri et al., Nature Biotech 17:1105-1108 (1999), hereby incorporated by reference in its entirety herein) which can be adapted for the study of colon or colon cancer related polypeptides of the invention in the various functional assays described above. Briefly, carbohydrate-specific chemistry for biotinylation is used to confine a biotin tag to the extracellular domain of the

colon or colon cancer related polypeptides of the invention, thus allowing uniform orientation upon immobilization. A 50uM solution of colon or colon cancer related polypeptides of the invention in washed membranes is incubated with 20 mM NaIO₄ and 1.5 mg/ml (4mM) BACH or 2 mg/ml (7.5mM) biotin-hydrazide for 1 hr at room temperature (reaction volume, 150ul). Then the sample is dialyzed (Pierce Slidealizer Cassett, 10 kDa cutoff; Pierce Chemical Co., Rockford IL) at 4C first for 5 h, exchanging the buffer after each hour, and finally for 12 h against 500 ml buffer R (0.15 M NaCl, 1 mM MgCl₂, 10 mM sodium phosphate, pH7). Just before addition into a cuvette, the sample is diluted 1:5 in buffer ROG50 (Buffer R supplemented with 50 mM octylglucoside).

It will be clear that the invention may be practiced otherwise than as particularly described in the foregoing description and examples. Numerous modifications and variations of the present invention are possible in light of the above teachings and, therefore, are within the scope of the appended claims.

The entire disclosure of each document cited (including patents, patent applications, journal articles, abstracts, laboratory manuals, books, or other disclosures) in the Background of the Invention, Detailed Description, and Examples is hereby incorporated herein by reference. Further, the hard copy of the sequence listing submitted herewith and the corresponding computer readable form are both incorporated herein by reference in their entireties. Moreover, the hard copy of and the corresponding computer readable form of the Sequence Listing of U.S. Patent Application Serial No. 60/157,137 and 60/163,280 are also incorporated herein by reference in its entirety.

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|--|----------|-------------------------------|------------|
| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

| | |
|--|-----------------------------------|
| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution <u>American Type Culture Collection</u> | |
| Address of depositary institution <i>(including postal code and country)</i> <u>10801 University Boulevard</u> <u>Manassas, Virginia 20110-2209</u> <u>United States of America</u> | |
| Date of deposit <u>20 May 1997</u> | Accession Number <u>209059</u> |
| C. ADDITIONAL INDICATIONS <i>(leave blank if not applicable)</i> This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE <i>(if the indications are not for all designated States)</i> | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS <i>(leave blank if not applicable)</i> | |
| The indications listed below will be submitted to the International Bureau later <i>(specify the general nature of the indications e.g., "Accession Number of Deposit")</i> | |

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ATCC Deposit No. 209059**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209059**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

| | | | |
|---|----------|-------------------------------|------------|
| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
|---|----------|-------------------------------|------------|

INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 20 May 1997 | Accession Number 209060 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |

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| For receiving Office use only <input type="checkbox"/> This sheet was received with the international application Authorized officer | For International Bureau use only <input type="checkbox"/> This sheet was received by the International Bureau on: Authorized officer |
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ATCC Deposit No. 209060**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209060**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
|---|----------|-------------------------------|------------|

INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> . | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 20 May 1997 | Accession Number 209061 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |
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ATCC Deposit No. 209061**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

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ATCC Deposit No. 209061

Page 3

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 *bis*)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution <u>American Type Culture Collection</u> | |
| Address of depositary institution <i>(including postal code and country)</i> <u>10801 University Boulevard</u> <u>Manassas, Virginia 20110-2209</u> <u>United States of America</u> | |
| Date of deposit <u>20 May 1997</u> | Accession Number <u>209062</u> |
| C. ADDITIONAL INDICATIONS <i>(leave blank if not applicable)</i> This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE <i>(if the indications are not for all designated States)</i> | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS <i>(leave blank if not applicable)</i> | |
| The indications listed below will be submitted to the International Bureau later <i>(specify the general nature of the indications e.g., "Accession Number of Deposit")</i> | |

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ATCC Deposit No. 209062**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209062**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit | Accession Number |
| 20 May 1997 | 209063 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |
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| For receiving Office use only <input type="checkbox"/> This sheet was received with the international application Authorized officer | For International Bureau use only <input type="checkbox"/> This sheet was received by the International Bureau on: Authorized officer |

ATCC Deposit No. 209063**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209063**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

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NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 *bis*)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 20 May 1997 | Accession Number 209064 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
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ATCC Deposit No. 209064**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209064**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 20 May 1997 | Accession Number 209065 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |

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| For receiving Office use only <input type="checkbox"/> This sheet was received with the international application Authorized officer | For International Bureau use only <input type="checkbox"/> This sheet was received by the International Bureau on: Authorized officer |
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ATCC Deposit No. 209065**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209065**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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|--|----------------------------|
| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> . | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 20 May 1997 | Accession Number 209066 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |
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ATCC Deposit No. 209066**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209066**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution <u>American Type Culture Collection</u> | |
| Address of depositary institution <i>(including postal code and country)</i> <u>10801 University Boulevard</u> <u>Manassas, Virginia 20110-2209</u> <u>United States of America</u> | |
| Date of deposit <u>20 May 1997</u> | Accession Number <u>209067</u> |
| C. ADDITIONAL INDICATIONS <i>(leave blank if not applicable)</i> This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE <i>(if the indications are not for all designated States)</i> Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS <i>(leave blank if not applicable)</i> The indications listed below will be submitted to the International Bureau later <i>(specify the general nature of the indications e.g., "Accession Number of Deposit")</i> | |

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ATCC Deposit No. 209067**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209067**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 20 May 1997 | Accession Number 209068 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
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| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
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| Authorized officer |

ATCC Deposit No. 209068**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

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UNITED KINGDOM

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ATCC Deposit No. 209068**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

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NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 20 May 1997 | Accession Number 209069 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
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| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
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ATCC Deposit No. 209069**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209069**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 *bis*)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution <u>American Type Culture Collection</u> | |
| Address of depositary institution <i>(including postal code and country)</i> <u>10801 University Boulevard</u> <u>Manassas, Virginia 20110-2209</u> <u>United States of America</u> | |
| Date of deposit <u>12 January 1998</u> | Accession Number <u>209579</u> |
| C. ADDITIONAL INDICATIONS <i>(leave blank if not applicable)</i> This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE <i>(if the indications are not for all designated States)</i> | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS <i>(leave blank if not applicable)</i> | |
| The indications listed below will be submitted to the International Bureau later <i>(specify the general nature of the indications e.g., "Accession Number of Deposit")</i> | |

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ATCC Deposit No. 209579**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209579**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

| | | | |
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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> . | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 12 January 1998 | Accession Number 209578 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |

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ATCC Deposit No. 209578**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 209578**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 16 July 1998 | Accession Number 203067 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |

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ATCC Deposit No. 203067**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 203067**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 16 July 1998 | Accession Number 203068 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |
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ATCC Deposit No. 203068**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 203068**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> . | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 01 February 1999 | Accession Number 203609 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
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| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |

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ATCC Deposit No. 203609**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 203609**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> . | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 01 February 1999 | Accession Number 203610 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |
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ATCC Deposit No. 203610**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 203610**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 17 November 1998 | Accession Number 203485 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |
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| For receiving Office use only <input type="checkbox"/> This sheet was received with the international application Authorized officer | For International Bureau use only <input type="checkbox"/> This sheet was received by the International Bureau on: Authorized officer |

ATCC Deposit No. 203485**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. 203485**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 18 June 1999 | Accession Number PTA-252 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
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| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |

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| Authorized officer | Authorized officer |

ATCC Deposit No. PTA-252**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. PTA-252**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> . | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 18 June 1999 | Accession Number PTA-253 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
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| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |
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ATCC Deposit No. PTA-253**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. PTA-253**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

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| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

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| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input checked="" type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 28 October 1999 | Accession Number PTA-881 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
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| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
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ATCC Deposit No. PTA-881**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

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ATCC Deposit No. PTA-881**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

| | | | |
|--|----------|-------------------------------|------------|
| Applicant's or agent's file reference number | PA005PCT | International application No. | UNASSIGNED |
|--|----------|-------------------------------|------------|

INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13 bis)

| | |
|--|-----------------------------|
| A. The indications made below relate to the microorganism referred to in the description on page <u>311</u> , line <u>N/A</u> . | |
| B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/> | |
| Name of depositary institution American Type Culture Collection | |
| Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America | |
| Date of deposit 28 October 1999 | Accession Number PTA-882 |
| C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/> | |
| | |
| D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States) | |
| Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC). Continued on the Attached Pages 2 & 3 | |
| E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) | |
| The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit") | |

| | |
|--|---|
| For receiving Office use only <input type="checkbox"/> This sheet was received with the international application Authorized officer | For International Bureau use only <input type="checkbox"/> This sheet was received by the International Bureau on: Authorized officer |
|--|---|

ATCC Deposit No. PTA-882**Page 2****CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

ATCC Deposit No. PTA-882**Page 3****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

What Is Claimed Is:

1. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 95% identical to a sequence selected from the group consisting of:

(a) a polynucleotide fragment of SEQ ID NO:X which is hybridizable to SEQ ID NO:X;

(b) a polynucleotide encoding a polypeptide fragment of SEQ ID NO:Y which is hybridizable to SEQ ID NO:X;

(c) a polynucleotide encoding a polypeptide domain of SEQ ID NO:Y which is hybridizable to SEQ ID NO:X;

(d) a polynucleotide encoding a polypeptide epitope of SEQ ID NO:Y which is hybridizable to SEQ ID NO:X;

(e) a polynucleotide encoding a polypeptide of SEQ ID NO:Y which is hybridizable to SEQ ID NO:X, having biological activity;

(f) a polynucleotide which is a variant of SEQ ID NO:X;

(g) a polynucleotide which is an allelic variant of SEQ ID NO:X;

(h) a polynucleotide which encodes a species homologue of the SEQ ID NO:Y;

(i) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(h), wherein said polynucleotide does not hybridize under stringent conditions to a nucleic acid molecule having a nucleotide sequence of only A residues or of only T residues.

2. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises a nucleotide sequence encoding a protein.

3. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises a nucleotide sequence encoding the sequence identified as SEQ ID NO:Y, which is hybridizable to SEQ ID NO:X.

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4. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises the entire nucleotide sequence of SEQ ID NO:X, which is hybridizable to SEQ ID NO:X.

5. The isolated nucleic acid molecule of claim 2, wherein the nucleotide sequence comprises sequential nucleotide deletions from either the C-terminus or the N-terminus.

6. The isolated nucleic acid molecule of claim 3, wherein the nucleotide sequence comprises sequential nucleotide deletions from either the C-terminus or the N-terminus.

7. A recombinant vector comprising the isolated nucleic acid molecule of claim 1.

8. A method of making a recombinant host cell comprising the isolated nucleic acid molecule of claim 1.

9. A recombinant host cell produced by the method of claim 8.

10. The recombinant host cell of claim 9 comprising vector sequences.

11. An isolated polypeptide comprising an amino acid sequence at least 95% identical to a sequence selected from the group consisting of:

- (a) a polypeptide fragment of SEQ ID NO:Y;
- (b) a polypeptide fragment of SEQ ID NO:Y, having biological activity;
- (c) a polypeptide domain of SEQ ID NO:Y;
- (d) a polypeptide epitope of SEQ ID NO:Y;
- (e) a full length protein of SEQ ID NO:Y;
- (f) a variant of SEQ ID NO:Y;
- (g) an allelic variant of SEQ ID NO:Y; or
- (h) a species homologue of the SEQ ID NO:Y.

12. The isolated polypeptide of claim 11, wherein the full length protein comprises sequential amino acid deletions from either the C-terminus or the N-terminus.

13. An isolated antibody that binds specifically to the isolated polypeptide of claim 11.

14. A recombinant host cell that expresses the isolated polypeptide of claim 11.

15. A method of making an isolated polypeptide comprising:
(a) culturing the recombinant host cell of claim 14 under conditions such that said polypeptide is expressed; and
(b) recovering said polypeptide.

16. The polypeptide produced by claim 15.

17. A method for preventing, treating, or ameliorating a medical condition, comprising administering to a mammalian subject a therapeutically effective amount of the polypeptide of claim 11 or the polynucleotide of claim 1.

18. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:
(a) determining the presence or absence of a mutation in the polynucleotide of claim 1; and
(b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or absence of said mutation.

19. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:

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(a) determining the presence or amount of expression of the polypeptide of claim 11 in a biological sample; and

(b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or amount of expression of the polypeptide.

20. A method for identifying a binding partner to the polypeptide of claim 11 comprising:

(a) contacting the polypeptide of claim 11 with a binding partner; and

(b) determining whether the binding partner effects an activity of the polypeptide.

21. The gene corresponding to the cDNA sequence of SEQ ID NO:Y.

22. A method of identifying an activity in a biological assay, wherein the method comprises:

(a) expressing SEQ ID NO:X in a cell;

(b) isolating the supernatant;

(c) detecting an activity in a biological assay; and

(d) identifying the protein in the supernatant having the activity.

23. The product produced by the method of claim 20.

SEQUENCE LISTING

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<120> Colon and Colon Cancer Associated Polynucleotides and Polypeptides

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<141> September 28, 2000

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<223> n equals a,t,g, or c

```

```

<400> 10
tctttttctc tcccactttt tcatattcct ctttttcatt tttgcctttc cgtttctgtc 60
tatgatgtag gcttctgagg agaaccmaga agcttggtct tagtggtaga atgacagrac 120
ttagggatcc cttgcaggct agaacaaagt tctgaccctt agaccaaattc tttatgttaa 180
gaagttttcc agaattcaaa aaaaaaaaaa t 211

```

```

<210> 11
<211> 532
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (515)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (517)
<223> n equals a,t,g, or c

```

```

<400> 11
taagagatca aagcttataa ttttcttttt taatttttga aggagggatc aactccagtt 60
tccaatgtct atgtgtctat gtgtgtatgt gccatacata tgtattcaca tgaagaccgg 120
catggccaag ttctgtctgga ggagcactca agtgtgacga gcagggccac tggaccctgc 180
agggctgtgg tgtatatagt gcagcttttg aggtggaact ctattttcac acttttctat 240
ggagccttcc gagtcccagg ttttcacttg aggctgtctg tctggatggc gggttttcaga 300
cctccattaa cateccctacc cagcattctg tacttcgggg gccttctctc ttgttataaa 360
actttttacc aagtgaacaa tcgataccac ctttgtttcc attctcactg gtgtaaatac 420
tgagtactaa ctgagaattt tgactttgca ttctgtcgga atacttgtgt tcaataaaaa 480
ttgaaagaaa aaagctaaaa aaaaaaaaaa aaancncga gggggggccc gg 532

```

```

<210> 12
<211> 1120
<212> DNA

```

<213> Homo sapiens

<220>

<221> misc feature

<222> (711)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (946)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (987)

<223> n equals a,t,g, or c

<400> 12

```
cataaacatt gatgttgggt caatcatgtt ctcaatgtat ttaaccatgt gtttttaaat 60
tttttaattt agttatcaaa ttgagaatct gatggtatgg cattaatcac cttgaggaag 120
aacctttatc gtttatctga ttttcagatg catagagctc tggctgcttt aaaaaataaa 180
cctctaaaac atgttcacaa ggtagtcaag gagcgtctgt gcccttgggt gtgttcacga 240
caacctgagc ctttcgggggt cagattccat catgcccatt gtaaaaagtt tcattcgaaa 300
aatggaaaatg accttcatcc actcgggtga ccagtgttct ctcaagtatc tgactgcgac 360
aggcttgaac aaaatgttaa aaatgaggag agtcagatgt ttacaggag actgagcaac 420
ttgacttcat cagaagaagt gctaagtttt ataagcacga tggaaaccct gcctgacact 480
atggcagcag gagctttaca acggatttgt gaagtggaaa aaaaggatgg tgatcaaggg 540
ctgccaaaag raatactgga gaatagcatc tttcaagctt tatgctttca gtttgaaaag 600
gagccctcac agctgtcaaa cactagttaa gtgactgctt tkcaagctct gattctgttg 660
catgtggatc ctcaaagtag cctgttgctg aacctgggtg cagaatgcaa naatcgtctc 720
agaaaagggt gcatggaagt tcgcaatctt tgtattcttg gggaaagtct gattacactg 780
cacagttcag gttgtgtgac actagaactc attataaatc aacttcaagg tgaaaaattg 840
gaaacattta ccccgaggga tattgtggcc ctttatagaa tcttgagggc atgtactgaa 900
aaagtggatg aacaccaaac attttttaaat aagataaaca actttncct atcaatagtt 960
tccaacctga gtcctaaatt gattagncaa atgctcactg ccctgggtgg tcttgatcaa 1020
agtcaagcat ttcctctgat tataaaattg ggcaaaatat gtcgtgaggc atgtcccaca 1080
tttcacttaa cgaggagctt aggagagtct tttgaggcgt 1120
```

<210> 13

<211> 600

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (50)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (571)

<223> n equals a,t,g, or c

<400> 13

```
ctagatcgtc agggaggaag ggtcagttgg gtgcctgttt ttctgttttn agtcctttaa 60
aatgagtaga agcaacctgt taccctggaa agagcactgg acatagacct agtgctgcgt 120
gatgttgagc acgtttcttc ttccctttga gtcccagttt cccttttggg tacaggggga 180
tagtagcccc cagggatcat gtgaaagtga gaaagccctt ttcacactgt ggagcgggtgc 240
agatgtggga aacctcaaag atggttgccc attttaaata ctttcatctc tcattctctc 300
ttcttctctc ctttctgccc tgacgtagcc atggttgggg gggtagggcc agaagaaact 360
gcctccgmaa gaggtagcag ccgctcaggt ggctctgctg gcacggagc ccacagaagt 420
gaggagtggc cgatggamct gccctccaaa tgtgcctgac tctgggtctt gctgtcactg 480
ggatttcctg ggcatggcag acagaaagaa agatagtttg accaagtcgt aggaagcttg 540
attccagcgg gtaaaaaagg gggcagggaa ntcgtccctt ttattttttg ctttcaggag 600
```

<210> 14

<211> 807

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (773)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (786)

<223> n equals a,t,g, or c

<400> 14

```
caattaaggg tgtacaaatt ataataatgc atctctatct tcatactttg aatggcaaac 60
gctattttatg cataaatatt ttcattttta gtaatatatg aagtgtaaat actcgatata 120
taagtataga ttttaaagat atgggacttt attttcacat aagtcaatag atgtttctct 180
agaacaaaat atttagtaaa gctttataaa ttatattaaa aggaagcggg gaacatgtat 240
tttttaacat agaacagaag tgacttcatt ctttttagac atcagaaatg ttaaagttga 300
ttcccaatat ttgttgtact tttttgtagc aaatgttaaa aatcacgagt taccatgtat 360
agaatgtgga ctgtcatgtt gatatcattg tacagtgata agccattttw atctgtatac 420
atttcaccaa tttattaaca ggttgaatat ttgtttcttt ttagaacatt ttatttatac 480
tgtgaagact ttgttatacc ttatttgcta caacatagat catatcattg ctactttgac 540
ttagcatttg catcataaac ataattatga tgtttttttc atgtctcttc caggggctca 600
gtcacttgaa gaaactgttg ctaaccaagc tcttgactct gtttccctta atgatacaag 660
tctctgtacc agcgttttat gttaattacc aaaactctcc tgcacagag catgatattc 720
ataataggag atactgsaat aaaatgrttw ggctgtaaaa atttggaggc acnaattttc 780
caattncaat ggcaaattgg catggtg 807
```

<210> 15

<211> 416

<212> DNA

<213> Homo sapiens

<220>

10

<221> misc feature
 <222> (1)
 <223> n equals a,t,g, or c

<400> 15
 ngtttttggga ttattataag ttcttgtgtc ttaaggccat ctgcttttat atccagtgat 60
 gtgggattttt aatcagccat taattaggta agcattcaact ttgaggacaa tattctgttt 120
 tatcttgggt agcatggaca gtttgtcaca gaaataagtt ccctattcaa acttggaatt 180
 agctgattca gagtaacata ttaataatat aaaaatggcc ataccctttt atggcgtaac 240
 attatttcta ggtattgttt ctaaggaaat aattttaaat attgggaaaa aatattttta 300
 caatttacag tctgtctgac atttggtaaa tagctaattg tgatatattc atattaggag 360
 atagggtgca gccactaaaa tgattttgaa gtattgtcca ttagtaatgg taattt 416

<210> 16
 <211> 752
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (40)
 <223> n equals a,t,g, or c

<400> 16
 ggccctgggct ccttccgaat ggtggcgccct ctgagccagn tttcgaggag gagtcggagg 60
 aggagcctga atgtttggag atagacttca agtcccggac cttatccgtg cgccgcttcg 120
 gtttgcaggt gacctttgcg tgcgggcgcc ccttctgatt gaccctgatg agctgtagct 180
 ctgatggccc ctccctcggg aatgattagg gtgacggctg kccgggggctc gttcgagtgg 240
 cgcccggccg gtggtgaccc gaacaggaga gcgggacggc gaccattctc tcgggagggg 300
 cccatytgga gaaagtcctc tcgcttggtc aaactaggag ggcgatagca ccggcccttac 360
 tgcgacgatg acaaagtaca acacaccgtc tggcgcgaa gagatgctcg agaacccttt 420
 gctgttggtta tttttcgcgt gtcctccgaa accaagggaa atgcggctct gtgggttctg 480
 ttaacgtcag catttaataa gtgaactcta aatgcattgc cccttatggg tgcgctggcc 540
 tcctgagttg actcagctct tgcaacgtag ctagttgata accctcgaaa tatagcgaat 600
 tgagatgtgc tatattgtaa aatacgggac ttagtacgaa aaaactgatg taaaaattat 660
 ctcaatactt tttaatactg attacatgtt ggaatataat gttttgcata tattgggtca 720
 aataaaaatg ttattaattt caaaaaaaaa aa 752

<210> 17
 <211> 481
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (442)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (447)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (448)

<223> n equals a,t,g, or c

<400> 17

```
ggcacgagtt tcaaaccaac actgaaattc tgtggcatca catatattgg gccttgatgt 60
catgacagak caaaatcatt tgatatccct ttctccattc taggtttttc tttttttcag 120
taactgattt accttgatca cttttcaact tccatattct tcatatagta aaaggcaaag 180
tggtgaagat actacggtgt ggtagtagtt gaaaattatt gccgtcatta ttacatact 240
taagacatat tagcaagttg atccaaaatg ggaggcctta tagatgtgct tgggggaaaa 300
tgaaggggag aaagtagcca tacaggagtt caaagaattc catgcccttc agattagccc 360
attaccagaa acatcatgaa agtattttaa aaactaatta ttactacag tgtatttcac 420
ttgtcttggt tgtctgaaca cnagganngc taaattagca agttttttta ggagggtattt 480
t 481
```

<210> 18

<211> 912

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (875)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (881)

<223> n equals a,t,g, or c

<400> 18

```
aattcggcac aggatcagac ttcttttcaa ctgtcctccc ctccaagcag accacctgtc 60
cccttctatc ccagctcaga gcagctgacc caactcagaa tctctttcct acaggatgaa 120
gtgccttttg aatgttattt taagccgaga gttaattttt ctacacaaca tattttccaga 180
catcttttag tcttttattg tcttagatac tataagaaga tgaacatgac aattttctag 240
aacctggtag cgtgtgtgtg tgtggcgggg ggtgctgagg gaggggagtg agtcacagga 300
gcctgtcccc caacagggtgt gactgctctg acaacctgtg gcatgctgca gggtcagggt 360
cctgatagga ggatttcatt actatgtcat tgtctccact catttttgac ccagtttgga 420
atgtatctgc aattgtgtgg ctcaacactt taggaaacaa tagattattt tatattatta 480
tttctgatgg tgacaagttt gtcttgaggt cacattttct ccttgaaaag tgacatcctg 540
tactttctgc tctcacta ctgccatata ttgtgtttt ttgttggtat tgtttgggta 600
gagcagttac aagaaacctt aaaaccttg gatataaaag aaatctgttt attgattttt 660
aaatctttcc ttccaaaag ctgggataca catgggagct gtttggggaa ttttccttgc 720
tgctaccgag ctgccaccaa atgggaattg accaggcggg ctgtttacac tgtttctttg 780
gccactgtgg ccyatggctc aggaatatgg ctactgggt aaggcttacc aaactcgggg 840
acaggggggc agggaaacag gaggggtgtt cccntcccc nttggcaggc cttcccaccc 900
acctggttaa cc 912
```

12

<210> 19
 <211> 507
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (489)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (492)
 <223> n equals a,t,g, or c

<400> 19
 ggatacatag gaagttgacc tcgggggtatc atggagagtg tccctcctag tggctggagg 60
 tagggacagt tggttgtggg gctggagaga gggtgtgggg aggaagcgag gatgcgtgcc 120
 tgccactagg atctgcatcc ccgagcccaa gccaggaggg atttccctta ggcaacacca 180
 tcccaggagg atctgccaca atttgcggtt cacagctraa gacgccgagg cttagagagc 240
 tcgacctcct caaggtcaca ccaactgggta aatagaggga tgcagactca ggttttgcta 300
 tgtgctcaca tttcaacttt atgcttaaca tgaatggaaa aatatgaaag taaatagtga 360
 aaagggtgagt tatgagctta gattacctag attattccag tatcccatgg aagctgagga 420
 cttattccgc tttccacacc gaacactaaa tgtggaccag tatcaagaac cctcctgtcc 480
 ccacgcagnt anaacccagt ggcttct 507

<210> 20
 <211> 410
 <212> DNA
 <213> Homo sapiens

<400> 20
 ggcagagcca aaagagggtt cttggatctc acgcaacaaa gagttcgggg cgagtccata 60
 gagtaaagtg aaagcaagt catcaagaaa gcaaaggaat aaagaatgcc tactccatag 120
 gcagagcagt ggcttttggt gctcagctgc ttgtacttgt tacttcttga gtatatgcta 180
 aacaagggat tgattactcc ttgttttagca gttttctggg aaaggagtgg gcaattccca 240
 gaactgaggg ttccctcccct ttttaagacc atattagggg gacttcctga tgttgccatg 300
 gcatttgtaa actgtcatgg cgctrtgggw gtgtctttta gcatgctaata gctttataat 360
 tagcgtataa tgagcagtga ggacaaccag aggtcactct tgtctgtgcc 410

<210> 21
 <211> 496
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (36)
 <223> n equals a,t,g, or c

<220>

13

<221> misc feature
 <222> (356)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (443)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (454)
 <223> n equals a,t,g, or c

<400> 21
 ggcacgaggg cacs mkcaaa ccttgtcttc cctctnctgt tgcacccctt ccctaccctt 60
 ccctcccagg tgctcggtac tttaccwagt ttctatatat cagtgtttta tgttggaatt 120
 tttccttggt tttatatttac tagttggtaa accctgttta tgctgaaaca aataaggaaa 180
 tggatatatt gaccatatgt gttattcata gaagacagta tgatcaaatt tgccaaaaac 240
 aagcaaacaa aacttaattc ctgrgaagta tgccttattt ttattgatct gctttgtctt 300
 acaattaagg tccaagagct tgggttaaact gtattatttg cctaagtata aaaganaact 360
 tgaactgcat tgcaatattg acgttcttta aaatgagaga cactgtcaag taatttaatc 420
 cagagatcag ccaccagatt tgnaatgcct atgnatgtgt gtgtgttggg agtgggtttt 480
 tcctttaaac caccca 496

<210> 22
 <211> 363
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (313)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (333)
 <223> n equals a,t,g, or c

<400> 22
 ggcacgagta taaatgatgg tgtggatgtc aggggtgaggg aggagacaaa accacgatga 60
 cccctagctt tgtggcctga actgtgggtg gctgagggga tcgttaattg aatggggcag 120
 actgaggctt gtraggaaga tcagagtctg gttcttgaca tgagatgcc tccaacatc 180
 tcttactca ggtgcaacta gggatacaga aacactgkat atttcaacag cagaaattga 240
 atggggggat tgatagcsct ggcgagggaa gcagctggta aagaagacag atggcaccct 300
 gagacagccc agnggtggaa taggaccccc agngtgcagg gattaaagtt ccatgggttg 360
 gtg 363

<210> 23
 <211> 239

14

<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (238)
<223> n equals a,t,g, or c

<400> 23
ctcaggctgc tgcacgtggs catccgcac cggccttityt tcgacagttt gaccgtggag 60
agcgcggacc tgcagggctg ctgcttttgct gggcctggca gccccaccc gagaagatgg 120
agttccggac ggcattctatc cgcctctttg ggcacttaac aaggctctgcc acggagactg 180
taaggacgtc ttcctggacc aagtgggtggg cgggctggcg ccctgctgct gcacctgna 239

<210> 24
<211> 461
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (426)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (428)
<223> n equals a,t,g, or c

<400> 24
aacaattaag tcttttaggaa tgtgtaacca gaactatggt agtattgctt ataaaaacttt 60
agttagggttc aatatataca tatatacatc tctatatagg tatatagatt tgcattttgt 120
cttgtaaaat tttatttgaa taaattcttc ctgtaggtaa tgggaaacaa aattaatagt 180
tcatatgtca ctcatagcat ttctatatatt gaaagtagcc caatataaaa cttttgattc 240
taaaattaaa ccagcagcct attacaagca cattctttga ttgagtcatt gggtataaac 300
ttactaaatg cagrgaagc agccaattta gggaaacttc tgagttgggtg gggacactgt 360
tggattaata atgtacggta tgaattaagt gatgccttaa cttggatttt acattttaag 420
gttaangngg gggcatatgg tcagccaact tagggggcat t 461

<210> 25
<211> 453
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (442)
<223> n equals a,t,g, or c

<400> 25
accagaccaa ccctatgaat ggctttcata taaacagggt gcagaattgt cggagtgcac 60

15

```

aggctcagca ctgatccaga agggcttcaa gactgcccc gatcagttca ttggcatctt 120
tgctcaaaat agacctgagt ggggtgattat tgaacaagga tgctttgctt attcgatgg 180
gatcgttcca ctttatgata cccttggaat tgaagccatc acgtacatag tcaacaaagc 240
tgaactctct ctgggtttttg ttgacaagcc agagaaggcc aaactcttat tagaggggtg 300
agaaaataag ttaataaccag gccttaaaat catagttgtc atggatgcct acggmagtaa 360
ctgggtggaac gaggccagag gtgtgggggtg gaagtcacca gcatgaaggc gatggaggac 420
ctgggaagag ccaacagacg gnagcccaag cct 453

```

```

<210> 26
<211> 1940
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (576)
<223> n equals a,t,g, or c

```

```

<400> 26
ggcagagggtc ctcagtgcag ggcaacagga ctttaggttc aagatgggtga ctgcagccat 60
gctgctacag tgctgcccag tgcttgcccg gggccccaca agcctcctag gcaagggtgg 120
taagactcac cagtctctgt ttggtattgg acgctgtccc atcctggcta cccaaggacc 180
aaactgttct caaatccacc ttaaggcaac aaaggctgga ggagattctc catcttgggc 240
gaagggccac tgtcccttca tgctgtcgga actccaggat gggaagagca agattgtgca 300
gaaggcagcc ccagaagtcc aggaagatgt gaaggctttc aagacagatc tgcctagctc 360
cctgggtctca gtcagcctaa ggaagccatt ttccgggtccc caggagcagg agcagatctc 420
tgggaagggtc acacacctga ttcagaacaa tatgcctgga aactatgtct tcagttatga 480
ccagtttttc agggacaaga tcatggagaa gaaacaggat cacacctacc gtgtgttcaa 540
gactgtgaac cgctgggctg atgcataatc ctttgnccca acatttctct gaggcattctg 600
tggcctcaaa ggatgtgtcc gtctggtgtg gtaatgatta cctggggcat gagccgacac 660
cctcagggtct tgcaagccac acaggagacc ctgcagcgtc atggtgctgg agctgggtggc 720
acccgcaaca tctcaggcac cagtaagttt catgtggagc ttgagcagga gctggctgag 780
ctgcaccaga aggactcagc cctgctcttc tctcctgtct ttgttgccaa tgactctact 840
ctcttcacct tggccaagat cctgccaggg tgcgagattt actcagacgc aggcaacct 900
gcttccatga tccaaggat cagtaacagt ggagcagcca agtttgtctt caggcacaat 960
gaccctgacc acctaaagaa acttctagag aagtctaacc ctaagatacc caaaattgtg 1020
gcctttgaga ctgtccactc catggatggg gccatctgtc ccctcgagga gttgtgtgat 1080
gtgtccacc agtatggggc cctgaccttc gtggatgagg tccatgctgt aggactgtat 1140
gggtcccggt gcgctgggat tggggagcgt gatggaatta tgcataagat tgacatcatc 1200
tctggaactc ttggcaaggc ctttggctgt gtgggcggct acattgccag caccctgtgac 1260
ttggtggaca tgggtgcgtc ctatgctgca ggcttcatct ttaccacttc tctgcccccc 1320
atggtgctct ctggagctct agaatctgtg cggctgctca agggagagga gggccaagcc 1380
ctgaggcgag cccaccagcg caatgtcaag cacatgcgcc actactcatg gacaggggccc 1440
ttcctgtcat cccctgcccc agccacatca tccccatccg ggtgggcaat gcagcactca 1500
acagcaagct ctgtgatctc ctgctctcca agcatggcat ctatgtgcag gccatcaact 1560
acccaactgt ccccggggt gaagagctcc tgcgcttggm accctcccc caccacagcc 1620
ctcagatgat ggaagathtt gtggagaagc tgctgctggc ttggactgcg gtggggctgc 1680
ccctccagga tgtgtctgtg gctgcctgca atttctgtcg ccgtcctgta cactttgagc 1740
tcatgagtga gtgggaacgt tctacttcg ggaacatggg gccccagtat gtcaccacct 1800
atgcctgaga agccagctgc ctaggattca cccccacct gcgcttcaact tgggtccagg 1860
cctactctg tcttctgtct tgttgtgtgc ctctagctga attgagccta aaaataaagc 1920

```

acaaaccaca gcaaaaaaaaaa

1940

<210> 27
 <211> 864
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (552)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (773)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (856)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (863)
 <223> n equals a,t,g, or c

<400> 27
 tctaaatcca ttacaaatct gcttagcttc taaatatttc atcaatgagg aaatcccagc 60
 cctacaactt cggaacagtg aaatattagt ccaggggatcc agtgagagac acagaagtgc 120
 tagaagccag tgctcgtgaa ctaaggagaa aaagaacaga caaggggaaca gcctggacat 180
 ggcacacagag atccacatga caggcccaat gtgcctcatt gagaacacta atggggcgact 240
 gatggcggaat ccagaagctc tgaagatcct ttctgccatt acacagccta tgggtgggtgg 300
 ggcaattgtg ggcctctacc gcacaggcaa atcctacctg atgaacaagc tggctggaaa 360
 gaaaaagggc ttctctcttg gctccacggg gcagtctcac actaaaggag tctggatgtg 420
 gtgtgtgccc caccocaaga agccaggcca catcctagtt ctgctggaca ccgaggggtct 480
 gggagatgta gagaaggggtg acaaccagaa tgactcctgg atcttcgccc tggccgtcct 540
 cctgarcagc ancttcttgt acaatagcat aggaaccatt aaccagcagg ccatggacca 600
 actgcactat caatctcggt cctgaacctc acctccaaaa agaaagcgac ttcagtagaa 660
 agtgggggtca gaaggaagag tgtgggtcctg gccacagctag acaaaaagcg ggatgacttt 720
 tgtaaacaga atcaggaagc atcatcagat cggttgctcag ctttacttca ggncattttc 780
 agtcctctag aagaagaagt gaagggcggg gaattttatt tcgaaaacca agggggggtaa 840
 ccgtctctgt tattcnagaa agnt 864

<210> 28
 <211> 703
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature

<222> (549)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (612)

<223> n equals a,t,g, or c

<400> 28

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gggtcgaccc acgcgctccgc caggagtagg tcctatcagt gcccccccag agtagagagc 60
aataagagcc cagcccagtg cagtcccggc tgtgttttcc tacctggtga tcagaagtgt 120
ctggtttgct tggctgccc tttgcctctt gagtgggcag ccttgggctt gggcccctcc 180
ctccggccct cagtgttggc tctgcagaag ctctggggtt cccttcaagt gcacgagggg 240
ttaggctgct gtccttgagt cctccattct gtactggggg gctggctagg acctggggct 300
gtggcctctc agggggcagc ctctccatgg caggcatccc tgccttgggc tgcctctccc 360
cagacccctg accacccctt gggtcctgtc ccccaccaga gcccagctc ctgtctgtgg 420
gggagccatc acggtgttcg tgcagtcctc agcgcttctc aatgtgtgtc acccggaacc 480
tgggagggga gggaaacttg gggtttagga ccacaactca gaggtgtctt ggccctcccc 540
tctgaccang cttatcctga gtttggtggc tacttccctc tggcctaagg taggggaggc 600
cttctcagat tntgggggca cattgtgtag cctgacttct gcaggagctc ccaattccag 660
gaaggaaaag agccaaggcc ccacttttgg ggatcagggt ggg 703

```

<210> 29

<211> 337

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (71)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (331)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (332)

<223> n equals a,t,g, or c

<400> 29

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aggtgacact atagaaggta cgcctgcagg taccggatcc ggaattcccg ggctcgaccca 60
cgcgtccgca nttacattta tgtttgtagt tctaagtaag accctgagag attttcaaaa 120
aggaattaat gattattttt gtcttcccca ggattggaac gagttactat gctgtttctg 180
ggattgcata atgttcgtca gacctccatg ttccctcgtg atcccaaacg actcactcct 240
taaattcaca ctttgccact taactccagt gtggatgaca gagcgagacc ctgcctcaaa 300
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa nnncccc 337

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<210> 30

18

<211> 631
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (524)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (608)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (615)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (630)
 <223> n equals a,t,g, or c

<400> 30
 agggaaactca ctgtgggtttt ratttgtatt tycttttttta agtgaaagca rgkttatttaa 60
 gaaagcaaag gaataaagaa tggctattcc ataggcagag cccattgcc ctcagctgct 120
 tatacttatt gttacttctt gattgtatgc taaacaaggg gtggattatt catgagtttt 180
 atgggaaagg ggtgggcagt atctggaact gaggggtttct cccctttgta gaccatacag 240
 ggcaacttcc tgacgttgcc atggtatctg gaaactgtca tgggtgctggt ggaagtgtct 300
 tttagcatgc tgatgcatta taattagagt ataatgaata gtaaggacaa ccagagggtca 360
 ctttcacgc catcttggtt ttggtcagct tctttactgc agcctgtttc atcattaagg 420
 tctttattac ctgtatcttg tgccgacctc ctgtctcatc ctgtgactta gaatgcctaa 480
 ctcctggga atgtagccca gtgggtctca gccttatttt actncacccc ctaattcaag 540
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 agcagaancc ttaantcca acagtcgtan a 631

<210> 31
 <211> 571
 <212> DNA
 <213> Homo sapiens

<400> 31
 gaattcggca cgagtccac cagccccca aaaaacctct cagtagtttc tttcagtgtta 60
 caaaatgatg agcatttttc tatgatgagg ttttaaccat tattcagggg ggtcttttgt 120
 ttttaaatct ttttttaact aataagattt acggtgtgta ttttatacag aaatgcatta 180
 taaatgtttt taattgtgtt ctgttttttg cagtctttta gtgccatgcc aattgttctt 240
 atattctata gaagttcgct caaaatactc aacaggggaa taggcagcgg acagtcagaa 300
 tggttggaat tttggctttc taagaaaaac tttattttgc ataagcatgt ggtcagatca 360
 ttttgtgcat atgcagcctg gattggatgt taagtaaatg cttgttcagt gccggtacat 420
 ttacttaaat ctgtttttat ttttgtcatg tagaatacta ctgtgggtcat cataatgtaa 480

19

tctattttctg tacctttttt tttttttttt acttttgaagt cttaaataaa atgtataata 540
 cccaaaaaaa aaaaaaaaaa aaaaaaaaaa a 571

<210> 32
 <211> 424
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (413)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (414)
 <223> n equals a,t,g, or c

<400> 32
 tttctaaaaa tcaggaaaat tagttactaa aaattgctga tcatttttgt ttcattatatt 60
 ttgttattttc aaatgtataa gctctgggat tcttttttggg gcaataccta caaagtcagg 120
 caccagaatg tgcctcagag ctgtgacatt tcaacatgat ggtttttggtt tggtttggtt 180
 ttgtgtcctt tttatttgca gtttttttctg ttgcaacaga aagtggcttg gaagtcttag 240
 gtgggtatgta acaaattctt tttaaaaatt ttaaagcagt atttaagtat tcttaaattgt 300
 gttaaattcat ttaatgtttt acttctaatt tcttgatatc tggctgtctg gttttattgc 360
 attttttaaaa aaactgaacc attaagkaat tggaaatgaa tgaagggtgaa atnncatgaac 420
 ctga 424

<210> 33
 <211> 1626
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (525)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (542)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (562)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (607)

20

<223> n equals a,t,g, or c

<400> 33

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ccacgcgtcc gacgcggcgc acgcggcagt cctgatggcc cggcatgggt taccgctgct 60
gccccctgctg tcgctcctgg tcggcgcgctg gctcaagcta ggaaatggac aggctactag 120
catgggtccaa ctgcaggggtg ggagattcct gatgggaaca aattctccag acagcagaga 180
tggtgaaggg cctgtgcggg aggcgacagt gaaacccttt gccatcgaca tatttcctgt 240
caccaacaaa gatttcaggg attttgtcag ggagaaaaag tatcggacag aagctgagat 300
gtttggatgg agctttgtct ttgaggactt tgtctctgat gagctgagaa acaaagccac 360
ccagccaatg aagtctgtac tctgggtggc tccagtggaa aaggcatttt ggaggcagcc 420
tgcaggtcct ggctctggca tccgagagag actggagcac ccagtgttac acgtgagctg 480
gratgacgcc cgtgcctaata gtgcytkgsg ggggraaacg actgnccac sggaggggaag 540
antggggagt ttttcgcgcc gnaggggggc ttgaarggtc caagtttacc ccatgggggg 600
aactggnttc cagccaaacc gcaccaacct gtggcagggg aagttcccca agggagacaa 660
agctgaggat ggcttccatg gagtctcccc agtgaatgct tccccgcgc agaacaacta 720
cgggctctat gacctcctgg ggaacgtgtg ggagtggaca gcacacagct accaggctgc 780
tgagcaggac atgcgcgtcc tccggggggc atcctggatc gacacagctg atggctctgc 840
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cctcggtttc cgctgtgctg cagacgcagg ccggccgccca ggggagctgt aagcagccgg 960
gtggtgacaa ggagaaaagc cttctagggc cactgtcatt ccctggccat gttgcaaaca 1020
gcgcaattcc aagctcgaga gcttcagcct caggaaagaa cttccccttc cctgtctccc 1080
atccctctgt ggcaggcgcc tctcaccagg gcaggagagg actcagcctc ctgtgttttg 1140
gagaaggggc ccaatgtgtg ttgacgatgg ctggggggcca ggtgtttctg ttagaggcca 1200
agtattattg acacaggatt gcaaacacac aaacaattgg aacagagcac tctgaaaggc 1260
cattttttta gcatttttaa atctattctc tccccctttc tccctggatg attcaggaag 1320
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agtttccact gtgtaacagg cagacatgta actattttaa gcacagttca gtccataaag 1500
ggctctgggag aaccagatga tgtactaggt gaagcattgc attgtgggaa tcacaaagca 1560
aatagtactc cagaaagacc ctgtctcaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1620
aaaaaa 1626
```

<210> 34

<211> 450

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (291)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (382)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (404)

<223> n equals a,t,g, or c

21

<220>
 <221> misc feature
 <222> (439)
 <223> n equals a,t,g, or c

<400> 34
 acccacgcgt ccgcgcgcgc ggtctatggc tgcgacttct ctaatgtctg ctttggtgc 60
 ccggctgctg cagcccgccg acagctgctc ccttcgcctt cgccctttcc acctcgccgc 120
 agttcgrgga akctctccct aggtcagggt ggagtgcagt gctgcaatca cggcttactg 180
 cagccttgac ctcttgggct caagtgatec tcccacctca gcttaaataa agctgttgct 240
 atttctggaa ggaaactggc ccagcagatc aagcaagaag tgcggcaaga ngtagaagat 300
 ggggtgggct ccaggcaaca aacggccaca cctgaatgtt gatcccggtt tggcgaaaaa 360
 tccctgcaag tcactcctaa tntcctccaa caaaaacaaa gggnaagttg caatttggtg 420
 ggaaatccac cagttgaana acaatttttt 450

<210> 35
 <211> 960
 <212> DNA
 <213> Homo sapiens

<400> 35
 attttttttt tttttttttt tttttttaaa acaacttctc aaattttattt aactcatgtg 60
 gttaacatgg tattgtataa aaagaaaaaa aaaacaccac tcaatactta ctaagccttg 120
 cagacagctc agagttgagg cagcatattg ggcatagaga tcataggatt tgtattatcc 180
 cttgcaagat ggaactccaa ccaacaccag aattttccaa ttcaaattca gtttttagtcg 240
 agaccccgagc ataattttta gaaaaaagat tggattgttg cttttctttt aattttccat 300
 tcctattttag acaaattgacc agaggcaatg acaaaagtaa ctgttttaaa gggattttctc 360
 tccagaagtt ttttctaaag gtttaagtcc aggctttcca tccttctctc catccttttt 420
 cattttaaaa agaagggttt tggratwtgt caacctttac tcagcttgct atacaaagcc 480
 actgcttttag tcctagacat aatgccagga ctcatctccc aaacttctgg tcttaataca 540
 gttcatgctt gggttgctaaa gaagctcatg ttaatcccaa agtcagcaca atcccaacct 600
 taaaaagcag acagcctgat tgcatactt acgacataca ccatcttgag gcaaaagaag 660
 ccagtcagac accccttgct tgctacgtgt gagacacatc agcagttgag cctgacccct 720
 tccgcagagc tcactgtgca aaatcaccag cacaccactg caatccactg agctcaccgc 780
 ctgtccagcc ataattggaag tcaattgaag gttatcattg taatagatga ttttccataa 840
 gtaactaata aaaatgtttt ctttgatgtt tagacctact aacaattcag tctctccctc 900
 tccatcctct cttaggggagc ctgtactttt aagcaaatag ggaagctaaa acctcgtgcc 960

<210> 36
 <211> 530
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (78)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature

<222> (362)

<223> n equals a,t,g, or c

<400> 36

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taacaattca atatataatt acacaaataa ttttttaaata taatcaatag taaagactgt 60
tctgtggatg gtagtgtnta atacattttc tattttgtac agtgatttta ggccaaacag 120
ctgctgattt taagaaaaca aaaggcctga aaccgcgtctt cgtgtctcct cctccctcctg 180
ccttcctcct tcttagctcc tctcctccag ggccagactg agcccaggtt gatttcaggc 240
ggacaccaat agactccaca gcagctccag gagcccagac accggcggcc agaagcaagg 300
ctaggagctg ctgcagccat gtcggccctc agcctcctca ttctgggect gctcacggca 360
knccacctgc cagctgtcag caaggcctgg ggaacttcag ccttggatgc agggccttat 420
cgcggtggcc gtgttcctgg tctcgttgc aatcgctttt gcagtcaacc acttctggtg 480
ccaggaggag ccggagmtgg gagtctctgt gggaacaga ttggaaggta 530

```

<210> 37

<211> 538

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (41)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (502)

<223> n equals a,t,g, or c

<400> 37

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gccgcggcca cggggcgcag gggccatggt gcgcggcagg ntcttccggc tctcggtccg 60
ggacgtgcgc ttccccacgt cgcttggggg ccacggcgcg gacgccatgc acacggaccc 120
tgactactca gctgcctatg tcgtcataga aactgatgca gaagatggaa tcaaggggtg 180
tggaattacc ttcactctgg graaaggcac trwagtgtt gtctgtsctg tgaatgccct 240
cgcccacat gtgctcaaca aggacctcaa ggacattgtt ggtgacttca gaggcttcta 300
taggcagctc acaagtgatg ggcagctcag atggattggt ccagaaaagg gcgtggtgca 360
cctggcgaca sggcgctcct aaacgcgggtg tgggacttgt gggccaagca ggagggaaag 420
cctgtctgga attacttgtg gacatggatc ccaggacgct ggtatcctgc atagatttca 480
ggtacatcac tgatgtcctg antgaggagg atgcctaga aatactgcag aaagtcaa 538

```

<210> 38

<211> 1256

<212> DNA

<213> Homo sapiens

<400> 38

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ggcacgagca ttaacaaaaa aatgtgcaaa cacactacta tgatttacca aaagactctc 60
tgcaagtggg aaatcattag ctctagtgtt gctcttttga acctcaggtc tttggggaat 120
ggtgcagaat tagtattgct tccttctttc tgtgtgtgat aatgggtgggg gaaggctagt 180
accatctctg tcatacatca aattcccata tgtgaataaa tttatgtatt tttactgcac 240
tctttttata ggtttatcat tcctgcacca acaacgaatg ccattattaa aactttatat 300

```

23

```

aaagtctcaa tatatggcac agtgcttcat ttcttttttt catctagagt gccttagcca 360
ttcttggttt tctgccgttc cacaaatagc aatgtaaatt tgtcagtata atagagaatc 420
cacttatatt tcttcaacag ctattgggaa tatggttggg attacttcaa ctctatgtat 480
caatttgagg agaattgata tctttataag attaatccaa atcacagcat gtcaaaattt 540
ccttattagg gtagttttta tgctcttcaa aaacactgta ttttcttcat atagatctaa 600
gaaaactttg gtgtttattc ctaagaaatt tatagtctct gttttgtaaa tgatatctat 660
tcttaagtta cacttaaaact tatttggtgc tgtatataga aatggaattg acttctatgt 720
acagcagttg caaactgata ttcatatgca gaaagtgtaa ctagaccctt aatggataaa 780
agacttaaat gtaagacctg aaagtatgaa actactagaa gaaaacatat gggaaacact 840
tcagtatcct ggcttggttg aagattttat ggagaaaacc tcaaaagcat aggcaacaaa 900
agcaaaaatg gacaaatagg attatatcaa actaaaaaga ttcagcacag taaaataaat 960
aatcwataga gtgaagagac aaccttcaga agatatttgc aaactattca tctgacaagg 1020
gattaatatt tagaacatac aaggacctca aacaactgag caacaacaac aaaaatatcc 1080
aattttaaaa atgggcgaaa gagccaaata aacatctctg aaaaccagac gcaagtggcc 1140
aacagggtata tgaaaaaaa aaatgctgaa caccgcta atcatcaggaa atgcaaacca 1200
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```

<210> 39

<211> 666

<212> DNA

<213> Homo sapiens

<400> 39

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tggcacctgc aggactgcga agatctcctt ggcgctgcgg ggccattggc ggggatgggc 60
gggggagggg ggccctcgacg gtttcccatc cccctctggc aaccctaate ttccttctcc 120
atctggggcc tggggcgctc tccaccaccc aggcgggatg ctttaaaaaa aattgctttt 180
taaagtgtct gtcgttgaaa gaaattagtc ttacccttga agtcargggc gcgtcctcgc 240
aatacacatc ttgttaggga aagtgttcgg ctccagctak ggttctacaa ggcgtttctt 300
gttcaccgcc ggagggaagc aggcctccga gtgactgcct tctgaaagtc ggtcttgtaa 360
caattggatg ratgcctttg aagagccctt gtccctatct tatgcttgaa aacagcgtgc 420
agtcctaatt ttcaagaacc acgaccacat aaaaacattg ctccccttct gctgctttga 480
aaacgacccc taaattccgt gtagaagttg ccaggctcgtc ttgacgtaca cttcgtttgt 540
atgatgtttg tctgtcaaat actgtgatgg aagagtgtat gcgggggagg agcaggggaat 600
ttttaaaarc attttccgk caccctcagac tgggagatca tggttctttcc tgaaaaaaa 660
aaaaaa 666

```

<210> 40

<211> 1016

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (6)

<223> n equals a,t,g, or c

<400> 40

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ctggcncctgc atcctcaaca tcctcaaagg gtacaacttc tcccgggaga gcgtggagag 60
ccccgagcag aagggcctga cgtaccaccg catcgtagag gctttccggt ttgcctacgc 120
caagaggacc ctgcttgggg accccaagtt tgtggatgtg actgaggtgg tccgcaacat 180
gacctccgag ttcttcgctg ccagctccg ggccagatc tctgacgaca ccactcacc 240

```

24

```

gatctcctac tacaagcccg agttctacac gccggatgac gggggcactg ytcacctgtc 300
tgctgctgca raggacggca gtgctgtgtc cgccaccagc accatcaacc tctacttttg 360
ctccaagggtc cgctccccgg tcagcgggat cctgttcaat aatgaaatgg acgacttcag 420
ctctcccagc atcaccaacg agtttggggg accccctcac ctgccaat tcatccagcca 480
gggaagcagc cgctctcgct catgtgcccg acgatcatgg tgggccagga cggccagggtc 540
cggatgggtg tgggagctgc tgggggcaca cagatcacca cggccactgc actggccatc 600
atctacaacc tctgggttcgg ctatgacgtg aagcggggccg tggaggagcc ccggctgcac 660
aaccagcttc tgcccaacgt cacgacagtg gagagaaaca ttgaccaggc agtgactgca 720
gccctggaga cccggcacca tcacaccagc atcgcgctcca ccttcatcgc tgtggtgcaa 780
gccatcgctc gcacggctgg tggctggcag ctgcctcgga ctccaggaaa ggccggggagc 840
tgccggctac tgagtgtctc aggaggacaa ggctgacaag caatccaggg acaagatact 900
caccaggacc aggaagggga ctctggggga ccggcttccc ctgtraagca gcagagcagc 960
acaataaatg agggccactgt gccaggctcc aggtgcctcc ctggcytgtc tcccca 1016

```

```

<210> 41
<211> 423
<212> DNA
<213> Homo sapiens

```

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<400> 41
agtgagctgt gattgcaaca ctgcacttca gcgtgggcaa cagagtgaga tcttgtctca 60
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gttttttagt tcgaacagtt tttttggtgg agtcttttagg attttctcta cttatgatcg 180
tgtcatctgt aaacagagac agttaacttc ctcccttccr atttagatgc cttttctttc 240
tcttgcctaa ttgcctaatt acagcatgtt cctattctgt aaatgttcaa tgaactagar 300
aatgattctt gggtagttaa tattgtcaat gttgatgaac tcttttctct cgctgaaagc 360
agctactttg ttggagggtt caattctgcg tggcaatttg cagcatttct agtgggtactg 420
ctc 423

```

```

<210> 42
<211> 961
<212> DNA
<213> Homo sapiens

```

```

<400> 42
gcctctacca cctcagttac agacaccacc aagggtcaaac agtgtatttg ctgtcaacca 60
agctgtgtca ccaaactttt cacaaggatc tgccataata attgcctctc cagtccagcc 120
tgtactccaa ggaatggtag ggatgatccc agtatctgtg gttggacaga atggaaataa 180
cttttctact cctcctcggc aggttcttca tatgcctttg acagcacctg tatgcaatag 240
aagtatccct caattccccg tccctccaaa atctcagaag gctcaggggac taagaaacaa 300
gccttgtata ggaraacaag taaataat tgggtgattcg tcaggtcatt cagttggatg 360
tcatgcacaa aaaactgaag tttctgacaa aagtattgcc acagatcttg ggaaaaaatc 420
agaagaaacc acagttccct tcccagaaga gagtatagtt ccagctgcta aaccatgcca 480
cagacgtgta ctctgtttcg acagcactac tgctcctgtg gcaaatacgc agggggccaaa 540
ccataagrtg gtgtcccaaa acaaagaaag gaatgcagtc tcttttctta atcttgactc 600
acccaatgtg tcctccacct taaaaccccc ttctaataat gctatcaaaa gagagaaaaga 660
gaagcctcct ctgcctaaga ttttatctaa atcggaaaag gccattagcc ggcataccac 720
cataagagaa actcaatcag aaaagaaaag ttcaccaaca gaaattgtgc ttgaatcttt 780
ccataaagca acagctaata aggagaatga attatgcagc gatgtaggaa agacagaaaa 840
atccagaaaa ttcaaaaacta tctattgggc agcaaaatgg gggtttgcca agtgagaaat 900
ctatagcttc actgcaagaa atgacaaaaa aacaaggcac atcttcaaac aataaaaaatg 960

```


25

t

961

<210> 43
<211> 545
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (12)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (34)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (142)
<223> n equals a,t,g, or c

<400> 43
ccaccgcggt gncgaccgct ctagaactag tggntccccc gggctgcagg aattcggcac 60
gagttggagt cctttgctgt tcccaatttg tggaagagtg aagacatcac ccaaatcgtg 120
gccaactatg ggctcatatg tnttactcgg gctggaaatg atgctcagaa gtttatctat 180
gaatcggatg tgctgtggaa acaccggagc aacattcacg tgggtgaatga atggwtcgct 240
aatgacatct catccacaaa aatccggaga gccctcagaa gggggccagag cattcgctac 300
ttggtaccag atcttgtcca agaatacatt gaaaagcata atttgtacag ctctgagagt 360
gaagacagga atgctggggg catcctggcc cctttgcaga gaaacactgc agaagctaag 420
acataggaat tctacagcat gatatttcag acttcccatt tgggggatctg aaacaatctg 480
ggagttaata actgggggaa gaagttgtga tctgttgccct aaactaaagc ttaaaagttt 540
agtaa 545

<210> 44
<211> 377
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (301)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (347)
<223> n equals a,t,g, or c

<220>
<221> misc feature

26

<222> (359)

<223> n equals a,t,g, or c

<400> 44

```

cgatcacccc cgaaccattt catcacgtat tcttcagtgg ctggacgagg agctgccccga 60
cctgtccgtg tctcgcagaa gtagccactt gcactggggc attccggtgc ccgggggatga 120
ttcgcagacc atctatgtat ggctgggatgc cctgggtcaac tacctcaactg taattggcta 180
cccaaagtgt gagttcaaat cttgggtggcc ggccactctc atatcatagg taaggacatt 240
ctcaaattcc atgccatcta ttggcctgcc ttctgtttar gggcgaggcat gagcccgcca 300
nagcgcattt gtgttccatt cccaatggaa cagtctgtgg gccaaanatt tccaagagnt 360
tgggcaagtg gtggatc 377

```

<210> 45

<211> 440

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (387)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (416)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (436)

<223> n equals a,t,g, or c

<400> 45

```

ttggacatcg tggccaactc tatcaagacc acaaatacca cttacaatta attttaaatt 60
attcatctgt acatagtgtt ctaaaatgta tataattcaa acagagcatc ttgtaactga 120
agacacacca tatctatgat atcgcattag tccatgtggg gaaaagaaag atcagattgt 180
tactgtgtct gtgtagaaaa ggaagacata agaaactcca ttttgatctg tactaagaaa 240
aattgtttct gctttgagat gttgttagcc tataacttta gcccctaactc tgtgtctaca 300
gaaacatgcg ctgtaatgga tcaaagttta atggatttag ggctgtgcag gatgtgcctt 360
gttaacaata tgtttggcag gcggtangcc ttgggtagaa gtcacggcc attccnccat 420
tccccggttt aaccnngggg 440

```

<210> 46

<211> 525

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (345)

<223> n equals a,t,g, or c

27

<400> 46

```

gtccggctgg gccgggacaa aagccggatc ccgggaagct accggctgct ggggtgctcc 60
ggattttscg gggttcgtcg ggcctgtgga agaagcgccg cgcaacggac ttcggcagag 120
gtagagcagg tctctctgca gccatgtcgg ccaaggcaat ttcagagcag acgggcaaag 180
aactccttta caagttcatc tgtaccacct cagccatcca gaatcggttc aagtatgctc 240
gggtcactcc tgacacagac tgggcccgc t gctgcagga ccacccctgg ctgctcagcc 300
araacttggg agtcaagcca gaccagcttg atcaaacgtc gtggnaaaac ttggtcttcg 360
ttggggttca acctcactct ggatggggtc aagtcctggg ttgaagccac ggttggggac 420
aggaagccac agttggcaag gccacaggct tcctcaagaa ctttctgatg gagccyttcg 480
tccccacag tcaggytkag gagttctatg tctgcatcta tgcca 525

```

<210> 47

<211> 414

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (403)

<223> n equals a,t,g, or c

<400> 47

```

ttagaaagar agggggctgg gggccgagac ttctgggtcc ctgtatgttg cagaggggtg 60
catgtcatct ccatggagaa ggctgtgtac gctgtcacgc aatcccttgt aagaggccag 120
gcccttgggg gaggaggag cagctgtggc tcacacagcc ccaggaaacc acctcttcct 180
tcagtgaagc agatagatag agaatcccg t gacagtgaac ggcaagtga tagccagata 240
gaaagcattt ttgtgtaata actaattttt gtttgccttc ctctctctct tccccgccct 300
ccccatccgg attcccggtg ctgtgtgcat ctctgsgctg tgtccccatg tctgcccgca 360
gtgcgcttct ccgagaaggt cactgtccat tcctgggtgt ctnggcaagg ccgg 414

```

<210> 48

<211> 323

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (11)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (274)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (321)

<223> n equals a,t,g, or c

28

<400> 48

```

tcgggtccgg nattcgccgg tgccggggac agaaacctcc tgccttctta gttcataacc 60
cccccttaca ttagattcta accctgtggt gatttttaggt tgggatttgg gcgcctgcag 120
atggctccga agccagcctc ttgtgatccg agccacttct ctggcactcg gagcgctggc 180
acccgcggag cccttggttc accggaccgc ctgggaacct ggccggggtc tctggcagcc 240
tcccagggct gaggttcaga ctctgttccg cctnaccag gtccacacct ggatagggct 300
gggagttgag gcttggtttt naa 323

```

<210> 49

<211> 841

<212> DNA

<213> Homo sapiens

<400> 49

```

tcgacccacg cgtccgsaga tttcagcctc acatactaag taaatactga taaataagga 60
aattagaaat ttagtattca taattaaata tgctctaaaa tttcckrtac ttttatttcc 120
tgtttattct taggtagatt ggaaggggga aacagtctgt tctccetaat taaatTTTTT 180
ctaataacga ttagtagaat atggacattc tatatgacag tgacattaaa agaggctctt 240
tggaagtata tacattatta acataatgtg tacaagtcct tttgaaatga caactttaat 300
gggtttcagc tcttttatct agagcttgag ataattcaag ctgagttttt cagggcatat 360
cacaacggca aagtgttcag cagtgggata tcaatgctta tttacatttt cctactgcta 420
tttatataaa atgttattcc attcagagga tgccttttat cccacatta aagcacagat 480
cattaagcaa taaaaaccaa attgtctgtc attcaaatta taactgcagt tttttttgca 540
tggttaagagt gaggtgctaa ttttgtgtga gatgaacttt gtaaactact ttgggaaatg 600
ttctttggaa gtaaggTTTT ttctccttta gtcttatgct tccacttttg tctcagattc 660
acaatccatt aaaamawggg gaaaaaagaa aargtaaaat tgagagactt ttgttagagg 720
agctatttgg aatgaaccaa cattycasat ttcccaaaat gtaagttagg aagtctccat 780
kgycyckgcc attacaaaaa tacactgkta ctatcttaat ctcaagagtg tcattacagt 840
g 841

```

<210> 50

<211> 534

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (423)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (430)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (524)

<223> n equals a,t,g, or c

<400> 50

29

```

aggaaattta gaaaatgatg aattcttgtc catttttgta atcaagattt taggaaaaac 60
agaagtacat ctatctttat gaaatttttg gcaggttttt gtgtatcaat attttgtact 120
tttaggggaat atttttatttt ttagttattt gtgtcaaatt ataattataa aaggtacagc 180
agaaaaatata ccatgttttt atatagggtc acacctgtac ttaggagggg cctgtccat 240
ctatatactt tttgtataaa attttaaaat gttaaagatc cacaagggtc taataaaatg 300
attctatagc tagaaaaacc attaccttcc cagtggcttg cactaaaata tacctgggaa 360
aaggaaccta gaaagactgg taactaatgc ctggaaatgt tctatattga atgtaccatg 420
ccnctggtnn gggaaaaatg tactaataat gggaaatggg aataaaccca gaaatccgaa 480
gttaattcca gcctaaaaaa aaaaaaaaaa aaaagggggg gccncccta gggg 534

```

<210> 51

<211> 317

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (222)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (250)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (265)

<223> n equals a,t,g, or c

<400> 51

```

ggcacaggaa aaagcacttt cttaagccta cagtatcaga tcaatgggga aaacaacaga 60
aaactaagag gagaattttc ccgttaattt tcttgcagaa aagtataagt ctaattgccc 120
attgccataa attttgtctt gtactcagag aagcaacatg cactggctca ttttatgtgc 180
aaagaaaaga tttcaccatt aaaaaaatta acttggctag gnatgggtgc tcacactggg 240
gaatcccagn cactttgggt ggctnaaggc agatagactg cttgaaaccc aggaattcaa 300
gaccagcctg ggacaac 317

```

<210> 52

<211> 1789

<212> DNA

<213> Homo sapiens

<400> 52

```

ggcacgagga aacggacaac aatgttggtg caaaaactgg atcaggctac cataatcttt 60
tttcttacat tccacttttc tatcttttcc aaatattcca cagtgatcat gtattaattt 120
ttctcttatt ttgatgttgc aaatatttat tttattatgg aaaacggcaa gctacatatg 180
gggaaaaaga aaaattgaaa ttatgcaatg gcctaccact caagagataa ttattaagat 240
tgtgggtgtac ttttttctat atactttttt ttaaaggaaa ggatcttact ctgtcgacca 300
gccctcacc tcctttgact agctgggatg acagcacatg ccaccatata caagtatttt 360
tgtatttttt gtagagaagg ggtttcatta tgttcaaact cctcagctgg cctgcttgat 420

```

30

```

ccgatgcttg ttagccttga catttacaat gaacacaagt gtgttgccat cttctgtctt 480
cttcacagac aacttagtag tcaggggaac ttgatgatgg ccaagtgggc aagctcctca 540
gggctgtctt ccgtggatac ttgagctgcc ccaggagcca cagcgtctca ggcagctgaa 600
aagtgagtga catgtagggg gtgtgtgtgt gtgtgtgtgt gtgtgtatgt gtgtgtgtgt 660
gtagctgtaa cacctcagcc ttgcctcctt ggccctcaca gcccttgctt tagctttggc 720
tttgagagag gcagaggctc cctcttttgc cctcactgtt atcttgggtga aaagccagtt 780
tggcagtttc tttttttaaa aaaatgcaag tatcataatt cagcaatcac atttgggggc 840
aatttatccc agagaaaggg aaatttatgt tcacataaaa acctgaatta acttcaaggg 900
aatgttattt aacaaacagg ttttctcact taactgatta tattcttgat ggatacacia 960
attaaatctt aatacaatat ctccagtggg tcctccaaag ttgtatctgt tttcatgggc 1020
cagaatgagg gaaagtcatc ctggccattc tcttttgcag agaagggtcat tctcttttct 1080
atatgaggag catctctcaa ctgcaagggtg cagctcaaat atctgtctat gtatagatac 1140
gactttcaaa gtctagatag gaatggcttg aacataccat ccacatttta tggaaaatcg 1200
cttggtttctc ttttcccttg tcttaatctg tttgtgctgt aaacaaaaca aaataccaga 1260
gactggataa ttataaaaca gcaggagttt atttctcaca gtttcagagg ctgggaagtc 1320
caagatcaag gtgccggcag gcttgggtgtc tagggaagga tcattcctta tagatggtag 1380
catctagggtg tcttcacatg gtaaagggaa ggaagggcaa acagggacct agttgggtccc 1440
cgccagacct ttcataagggt cactagtccc actcatggag gctctacccc catgacttga 1500
ttttttccta aaggcccccac ctcttgacac tgttgcaattg aagattaaat ttcaacatga 1560
attttgaggg gaatgcaaac attcaaacia cagcactccc tcatctatag atttctacaa 1620
ctttcagatt attgcagcaa gtgggttccat ctgtaaataca cttggctagc ttatgtgtgt 1680
tgtctctctt ccataacaca tcaacccaag atttccaaca aaagaataat aacttaaaac 1740
aacaacaaaa aaactcactc acacaaagta tgtgtataag caggttgta 1789

```

<210> 53

<211> 654

<212> DNA

<213> Homo sapiens

<400> 53

```

aattcggcac aggcattgggt gtccctctgt actcagaatg gggttcagscc aagtcggtra 60
aratggatgt tggcaaaata ggaggatacc ctcatcttgc gaatggggga cctgctctga 120
gcctgcccag kggccaggcc tgctccaggt taaactggac ggaaggccca ggtctcagtt 180
tctttcaacc aggagaggcc gctgcctaga gcccctcccc accttttctt ggatgggtga 240
ggcaagccag gagagcaagc agtgttgtcc tcacgggagg aggactgagc gactgggaaa 300
actcggctct acatctcacc cagaacggct tttagaaaca ccacagctgg agagtcctgg 360
ctgagccttg ggagtttcag ctctttggcg gggtgcccag gtgccatgag atcagcgaag 420
cctgcgagtt ggcaggactc tgaggtttcc tgcagaccat gccatgagat tgaagggtgcg 480
gggaaataaa gaaaaatcac cttttaggag actccattct tccctacaa cccagctgtg 540
gtcccagaga tcaggggggtg ttgccagggtg tggctgggga aggggtctggg ttcacaaaact 600
caccggcact ctttagtccc cgtataacat ggtggttaag gataaagatc ttga 654

```

<210> 54

<211> 334

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (154)

<223> n equals a,t,g, or c

31

```

<400> 54
ggcacgtagg ggatgcccac cgccagtcaa aggggtgggg gtggtctctg caccttaagt 60
actaacctgc cgcccacgcg cctcctgacc acagcacccc gtcggctttc taattctgtg 120
agctgccctc gtgggcgtgg cctccctgtg gagntcccca tgtgcctccc cttgggtccag 180
cctgcagcta ggaagtgggt cacagcgacg gggctgggct gggccaggcc aggctccggg 240
agatgtggaa ttggcgaaac aactgcccc atagtatcct ccgcctaggr ctccaagagg 300
tgggaattgg ggcactacgg ccgggtaagg cagt 334

```

```

<210> 55
<211> 474
<212> DNA
<213> Homo sapiens

```

```

<400> 55
tgcaaacatg atggatgggg aaagcatagt aactgtactc accaacaaga tgctggagtg 60
acctgctcag atggatccaa tttggaaatg aggctgacgc gtggagggaa tatgtgttct 120
ggaagaatag agatcaaatt ccaaggacgg tggggaacag tgtgtgatga taacttcaac 180
atagatcatg catctgtcat ttgtagacaa cttgaatgtg gaagtgtgtg cagtttctct 240
ggttcatcta attttggara argctctgga ccaatctggg ttgatgatct tatatgcaac 300
ggaaatgagt cagctctctg gaactgcaaa catcaaggat ggggaaagca taactgtgat 360
catgctgarg atgctggakt gatttgctca aagggascag atctgacctg aractggtaa 420
tggagtcact gaatgttcag gaagattaga agtgagattc caaggagaat gggg 474

```

```

<210> 56
<211> 367
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (250)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (252)
<223> n equals a,t,g, or c

```

```

<400> 56
ccggcctcaa gcaatcctcc cactggcctc acaatgttgg gattacaggt ataagccact 60
gcacacggcc ttactatgct atcaattcca tatatggaaa ggtgttttcc ctttcagagc 120
tctttaaagc tctgcagaag atttacatgt gtttatagag ctaagagaaa tcagggcatg 180
gaaattgagt gtgtaataaa aattaaactc ttcattgtat ataactcatg ataacttcta 240
tcttcattcn cnggaagtgt cctagagcac catcacagct aggaagcttc catcatggat 300
taccttattt cccaaagcaa gtactccaat aattgtctca agagaggaag gacaactggt 360
taccagc 367

```

```

<210> 57
<211> 564
<212> DNA

```

<213> Homo sapiens

<220>

<221> misc feature

<222> (542)

<223> n equals a,t,g, or c

<400> 57

```
caaccccccta cagatatcaa gggaccacta tacacattag gatgatctat attgaaatct 60
acatggaaca gagtgggact tctaattgta tgacttcaag attttgcttt gtttaaatta 120
ataactgttt tcagaattaa gtgcttaaaa acaaatttga ttgaaaagtt caagacaaga 180
attttgctct ctatggctgt tccatataaa tttgatgggt gattctgaat gtaaattgact 240
gaagaattaa aaaataagaa attccttttt aaaaggcatg cctcttgac tgtgaacaag 300
acagtagtcc cttaaaccat gaatatgtca gtgttctatg gattacgaaa ttagtaatgt 360
tgcttagccc aaacgtgttt tttaaaaagt atagttttgt acatctcyaa gttatcaaac 420
ttcaaaattg agaacaaatt taaaagtcca tatatgcaac tctagtaagc acttaatagg 480
ttacatagca ctgggttaaga acaattaatt ttgtttctat attattacta attattatta 540
cnaatcaaaa aacactgtga taag 564
```

<210> 58

<211> 444

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (358)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (382)

<223> n equals a,t,g, or c

<400> 58

```
ggcacgaggg aaaaccataa ctgcctctta atttaacata gaataatata tagttctgta 60
ttttttttta agtgagctta atgggtaagt attttttata tgcttttagct atagctaaag 120
aaaactgata cttaacaaag ttgaatagta ttattcactg gtgctcctaa aatattgttt 180
ttcagtgtaa aatatgcata tcttctatat ttaatatgaa agtccttgaaa tgtatcagac 240
agaaggkat ttcagtttgc aaataatgag caatgtagca attttaacac atttcataaa 300
tatatatatt gtcattggtg gagagcacca tttgttggtt tgaatatact ttaaaggnaa 360
gaggtacaag ggacataaat gntgagatta cctacaggat ggaaatagca gtacagttcc 420
attggtagat attttgaaat gttt 444
```

<210> 59

<211> 347

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (327)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (328)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (340)
 <223> n equals a,t,g, or c

<400> 59
 ttgagctcta aatgcaaaac tcttttatac tgaaaaaaca cttaaagyag ttttgtgtgg 60
 catcacagtg atttgtcatg aaaagccata tatggggggac atgctaaaat ggctttctgaa 120
 tgaaatacga cagcagagaa agatgccact gaaatgctga aattatcttt gctgagcagc 180
 ttttgaatgc taagggttcc agtatgtgac ccaaagaagg agttgtctca actccttggg 240
 acagggttca ttcaaaccac caagctgtga gagtgtgttt atttttaatt ttttaaaagg 300
 tattttaattt ccaaccacac ttcttanntt tttggaaaan gacaatt 347

<210> 60
 <211> 322
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (245)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (321)
 <223> n equals a,t,g, or c

<400> 60
 agctggggcc aaaaatagac cagaattatc tgctacttga atgtttggca aaactctcct 60
 agaaaactga gtctgatgtt tgatttgtgt aaagacttct ttaacttttc taactcaatt 120
 ttactaagt tataggacta ctcagatctt gtttcttttt tgctcaattt tgggtcaattt 180
 tgtttttgtc tatgtcacct aagtttycaa atgtattggc atgaatatat ycataatatt 240
 ccctnattat cttttacatt tctgggggat cttagcgggtg tttccctttt tatccctaaa 300
 atgttttatcc atgctttctt nt 322

<210> 61
 <211> 834
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature

34

<222> (793)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (810)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (814)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (834)
 <223> n equals a,t,g, or c

<400> 61
 gatatgatgc ccctccttca taattatgta acagttgata cagacacact tctgtctgac 60
 accaagtatc ttgaaatgat atacagtatg tgcaaaaagg ttcttacagg agttgcagga 120
 gaagatgcag agtgtcatgc agcaaaattg ttagagggtca tcattctgca gtgcaaaggg 180
 cgtggcattg accagtgcac tcccttattc gtggaagcag ccttagaaaag actgacaaga 240
 gaggttaaga caagtgaact tcgaactatg tgtctgcaag ttgcaattgc agctttgtat 300
 tataatccac acctactact cmatacctta gaaaatcttc gcttccctaa taatgttgaa 360
 ccagttacma atcattttat tacacagtgg cttaatgatg ttggactggt tcttggggct 420
 tcatgacaga aagatgtgtg ttctcggact ctgtgctcct attgatattg aacagatacc 480
 ccaagtttta aatcagggtt cyggacagat ttgcccggcy ttatccttt tatttaacgg 540
 attgaaaaga gcatatgcct gccatgcaga acatgagaat gacagtgatg atgatgatga 600
 agctgaagat gatgatgaaa ccgaggaact ggggagtgat gaaagatgat attgatgaaa 660
 gatgggcaag aatatttgga gattctggct aagcaggctg gttgaaagat gggagattga 720
 tgaaagattg ggaagaaaga tgatgctgaa agaaactgct ctggaaaggc tattcccaca 780
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<210> 62
 <211> 1796
 <212> DNA
 <213> Homo sapiens

<400> 62
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 tactggaaac ttgcattatt tacagccatt aggagctccc tggcttccat tccactcatg 120
 actagcttta cctctttgac cccactgtat tattgtctag cccagttcag ctgaatcttt 180
 caacacaaaa tatacaggga accccttcct ggggaacttc ctttggtatt gaggtcttcg 240
 ctgatggctt ctccatttg atactcagtc tcagtcacag taggattacg gaatcttttg 300
 ccagagtatc aatctacatg ggtgctacac attactgaaa aaaattagga acatgggtgct 360
 agttaattca agtcttcatg taaaacttct tctatcatag tggacattaa aaaaaatctc 420
 tctgcaaagt gcattgaccc tacctctagt agatgaatgt tgaacaagta gcctatctag 480
 gaagcaagtg actagcatcc atgggcatcc cacaggttgt agtccagccc cgatcttggg 540
 ggttgggatt gatgttgctg ccaagtcctt ccgtttcatg ttcaggctct gcctatgttc 600
 ctggtgtctg gtacctgatt ttccaggatg ctgacattta cttcttgccc acaacaccat 660

35

```

ataccctaag tcttgccaac atctttgaat gtctttctgt ggtctgtctc tcctccgttg 720
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gatttttagct ttttactagg tcctgacatt cccgtagttt cctcttacct ttctggacat 840
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<210> 63
 <211> 1376
 <212> DNA
 <213> Homo sapiens

```

<400> 63
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atgtcagtgat agatttgcac tgaatcatgc cattatgttt tttctcattt ttatgctgtt 180
gggtcttagt ttttaaatg atataaagaa ctacagcaatg gttttatttt ctactcatat 240
ttaggggttta ggaaacacta ccactagtta tcatttaatc aacttcaatg gtctactgaa 300
acaaaaatgg taacttttca ttagtggtt atttagagtt atagtagttg tttccagaaa 360
acacttcttc acaattgtac tccccaatca aatcatgtga tcatacagtt attcccatga 420
aaggcagaat gtttggttca aaattaatct agttttctgt acatttaaat ttgagaagggt 480
gacaactggc tcttttccag tcttcttca tgcagtttt ctgatagacc actattggca 540
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taaatagtga actaaaactt ttggcagatc agcaacattt gctgagcctg ttttttaagc 660
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gatttggtggc aaatcattta tttgcctttt taaaaattca ttttaagcagt tcagagagta 1260
gactactcag aaaattattt cacgtaattg tctaagagggt caatattttt taatgcatat 1320
tgaatcaaat aaagtgtctt aaagaaatta ttctccaaat aaatttttaa aaaaaa 1376

```

<210> 64

36

<211> 574
 <212> DNA
 <213> Homo sapiens

<400> 64
 ggcacgagct gaaaggtggg ggaaggggaac gtagacctag agaggggaat tcttacagaa 60
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 cctcagattg tcggcttccg cctctttctg ctttctgctg atcaacgggt taggggcagc 180
 accccctggg cgccctgagg cgcagctcct cctctcagct ctgagcataa agagccggta 240
 gccggggacg cagtggccgg gccaaaggat ggcagcggcc cagaggtccg aggcgctcgg 300
 aattccgagc cgcaggacga gggagagctt ttccagggcg tggatccccg ggcgctggcc 360
 gcggtgctgc tgcaggcact cgaccgtccc gcctcaccac cggcaccaag cggctccagc 420
 caggggcccg aggaagaagc agctgaagct ctgctgaccg agaccgtgcg cagccagacc 480
 cacagcctcc cggcgccgga gagcccgagg cccgcgtccg cctcgcctcc agactccgga 540
 gaatggggccc gaggcgagcg atccctccga ggag 574

<210> 65
 <211> 603
 <212> DNA
 <213> Homo sapiens

<400> 65
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 tgagagccga ataaggtttg cctgaaataa ctgacactat ataatttctg ctttggcaaa 120
 tactaagttc taactttgtca ttcttggttag aacaagcttt atttttcgag cctagcaatg 180
 atctagaagc agatgtttatc tcagtgcctt ttgcaatttg ttgtgtgggt tttttttttt 240
 ttaaagccac acaataattt tggaaaacaa tgtatgggta gaacatgtgt ctgttaattg 300
 cacacaaaac cactttttaat ggggtacagag ttaaatttga aggaataagt tcataatact 360
 gaagctagaa ccaagcagaa tctgtttttt tctgaggagt atcggtagca taaatgtgat 420
 tataaacata gtacacttga tatatggagg cagtgcagc tatttttaca aaattttaa 480
 ctgcaaatgg attcaacatg tttatgggtt attaaaattg tctgatttct taggttcttt 540
 atagtacacg tgttgaaaat aaatgattaa gaattgtttc aagaaaaaaaa aaaaaaaaaa 600
 aaa 603

<210> 66
 <211> 1772
 <212> DNA
 <213> Homo sapiens

<400> 66
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 cccagcgat ggcgaccctg tggggaggcc ttcttcggct tggctccttg ctcagcctgt 180
 cgtgcctggc gctttccgtg ctgctgctgg cgcactgtca gacgcgcga agaatttcga 240
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 ataagaacat atctcagaaa gattgtgatt gccttcattg tgtggagccc atgcctgtgc 360
 gggggcctga tgtagaagca tactgtctac gctgtgaatg caaatatgaa gaaagaagct 420
 ctgtcacaa caaggttacc attataattt atctctccat tttgggcctt ctacttctgt 480
 acatggtata tcttactctg gttgagccca tactgaagag gcgcctcttt ggacatgcac 540
 agttgataca gagtgatgat gatattgggg atcaccagcc ttttgcaaat gcacacgatg 600
 tgctagcccg ctcccgagc cgagccaacg tgctgaacaa ggtagaatat ggcacagcag 660

37

```

cgctggaagc ttcaagtcca agagcagcga aaagtctgtc tttgaccggc atgttgctct 720
cagctaattg gggaattgaa ttcaagggtga ctagaaagaa acaggcagac aactggaaaag 780
gaactgactg ggtttttgctg ggtttcatth taataccttg ttgatttcac caactgttgc 840
tggaagattc aaaactggaa gkaaaaaactt gcttgatttt tttttcttgt taacgtaata 900
atagagacat ttttaaaaagc acacagctca aagtcagcca ataagtcttt tcctatttgt 960
gacttttact aataaaaaata aatctgcctg taaaaataat taaaaaatcc tttacctgga 1020
acaagcactc tctttttcac cacatagttt taacttgact ttccaagata attttcaggg 1080
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ccttctattt tcgagtttca tttatattht gcagtgtagc cagcctcatc aaagagctga 1260
cttactcatt tgacttttgc actgactgta ttatctgggt atctgctgtg tctgcacttc 1320
atggtaaacy ggatctaaaa tgcctgggtg cttttcacaa aaagcagatt ttcttcatgt 1380
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ctccaatgtg tgcagctttg aactagggct ggggttgtgg gtgcctcttc tgaaaggctc 1680
aaccattatt ggataactgg ctttttttct tcctctttgg aatgtaacaa taaaaataat 1740
ttttgaaaca tcaaaaaaaaa aaaaaaaaaa aa 1772

```

<210> 67

<211> 1829

<212> DNA

<213> Homo sapiens

<400> 67

```

cggcacgaga ttggagccta tttagtggat tttatgcagc caaagatgtt tcttggtgtt 60
gttggtgttc ttgcttttaa ctaatttgcc tcccaggaga cagttgaaat gtctagagac 120
atthtgatta ttatgcctgg caggacgcca ctagtggcat ctagtggatg gagggtaagg 180
gtgtgcttaa gcgtcctccc atacacagga cagcaccccc cacaaagaat tatccaaccc 240
caaagtgcag tagtgctgag gctgagaaac cccactctgc tctctaacca aaattagaca 300
cagaaaagtg agacattcta ccacctgac aacatcaatg gcttttgccc atttaaaaca 360
agaaaagagga atatgtatcc aacccaaaac aacatcttaa cattctttct aataggcttt 420
tgcaaaaaata gttcatatth tataactgtc ttgcagcatg ggggtataagt gtaatcattg 480
taaaaaatgaa acctaatacat tgtaaaaatg aaacctaatc atggtaaaaa tgaaaagagt 540
gcctcaaaaac atctgaagtt cttagcaaaa ggcagcctgt cttcagtggg cacttttgga 600
tggaggcagg actaggggat cagtaggagt gagaacaaaag gtcagaaaaa tgagtacaca 660
gcacatgtat actgattaat ttctttcttt tttccttctt ttgatggagc aagactgtaa 720
cagaagcctg agagttagga agggctttgg caactattac tgtagacaca gtagtttact 780
caatthtatg aactcttagt cctgggctgg aattcacgcc tctgctggaa ttgcacagac 840
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acaaagtgag actctgtctc taaaaaaaa aaaaaaatth ctcagatgtg actcagtga 1440
ggattttgag atggggagag tatcttggat tagccagggtc tgtgagaact cctgacgtct 1500

```

38

```

gaagcttgac tcccaagttt ccatagcaac aggaaaaaaa aaaatctatc caaatctgaa 1560
gattgcgggt tacagctatc gaacttcaca actaggcctc aattgttccg gttttttatt 1620
ttctttacaa ttctacttag tctgtacttc atcattttga cagcatcttc ctccctcctt 1680
taattaatgg aatcttctga attttccctg aatgttttaa gatcatgaca tatgacttga 1740
tcttctggga gcaggaacaa tgactacttt ttctgggtgtg ttaacatgtc ggtgccgaat 1800
tcgatatcaa gcttatcgat accgtcgac                                     1829

```

<210> 68

<211> 1688

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (912)

<223> n equals a,t,g, or c

<400> 68

```

acccacgcgt ccgctcatgt ggacttatgc cagtctagag gcagaatcag aaggcttggg 60
tgaacatatc gctttccctt ttccctctcc ctccgccctc cccagtacag tccatctttc 120
aatgttgacg cctgggttag aaggagagaa aaagggtggc ggaatttcca ggagatcccc 180
aagaatgctg ccttgtctgt ggacaaagat ggaccatgtg cccttcggaa ttagggatag 240
aaacaaatat tgtgtgctct taacgattaa gctgtgttat ggtgggtttt caggttttta 300
ccttttttct ttaccccttt actctgcaag aatggggaaa gaatgcatac tgcgaaaatg 360
agtcttttaa attctgtctg cctactagtt ttaagtatat ggtatgttgt aaaatttcca 420
atgatgagag acagcacaat aaatgtacct tatctcctta ggctgaaggc cataactaca 480
tagtggagta atttaagaac tctcttgcc tccaccaacc aaaagggttg tttttgatag 540
caactggcta atgaattttt aaaaagagaa gaaaaatact agttttcccc tcttttggga 600
aatagatttt aaatggctaa actactagcc ttaaaactac tagtctataa atcaactacc 660
acttttgtga atctgacagg ccacattttt atatggccct ttacagaatg gagtgtgttg 720
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ccaaattttt cttcttaaaa aattggaagt ggggggaatc caatgacaaa aactaatgtg 1620
gcttggtttt ggagaaaata attactgtaa atggaacaac aacaacaata aaacacacgt 1680
taaacatc                                     1688

```

<210> 69

<211> 565

<212> DNA

39

<213> Homo sapiens

<400> 69

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tcattttgtg gacgaatatg atccaacaat agagagaaca aattaaaaga gttaaggact 60
ctgaagatgt acctatgggc ctagtaggaa ataaatgtga tttgccttct agaacagtag 120
acacaaaaca ggctcaggac ttagcaagaa gttatggaat tccttttatt gaaacatcag 180
caaagacaag acaggggtgt gatgatgcct tctatacatt agttcgagaa attcgaaaac 240
ataaagaaaa gatgagcaaa gayggtaaaa agaagaaaaa gaagtcaaag acaaagtgtg 300
taattatgta aatacaatgt gtactttttt ctttaaggcat actagtacaa gtggtaattt 360
ttgtacatta cactaaatta ttagcatttg ttttagcatt acctaatgtt tttcctgctc 420
catgcagact gttagctttt accttaaatg cttattttta aatgacagtg gaagtgtttt 480
tttcctctaa gtgccagtat tcccagagtt ttgggtttttg aactagcaat gcctgtggaa 540
aaagaaactg gaatacctaa gattt 565

```

<210> 70

<211> 675

<212> DNA

<213> Homo sapiens

<400> 70

```

ccagcatcag aagttctgat ggatgatgac cttcagaaaa gtgtggatat gatcatggat 60
atgttttgtc ctccaggaat aaaaattgat gcatatccgt gggtggaatg cttcatcaag 120
tcatacaatg tcacaaatgg aacagataat caaatttgct atcagatttt tgacaccaca 180
gtttgcagaag atgtaatcta atattgccat ccaatttagc atacataaaa tgttgccact 240
caccttccct gtttgagctt cttttcctga cctgagtttt gtatcagcaa tgttgatgat 300
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tgcaaggtaa ataatggcta tggattttgt tttgctttct gttttgcttt tgtacaaaga 420
gacctgctta aacaagtact gctgagataa gtgtctgac aagctacagt gtactttaag 480
tagaaatggc aaagtgtgct tgttgggggtg ctgatactga tgatttttagg ataaattcat 540
ttcttttaac ttgtaataca tggtttttatt gcttgtttct cyccaggata gtagagattt 600
ctctatttca cctcaamcta ataaaagtgg tcagatttat aatgttaaaa aaaaaaaaaa 660
aaaaaaaaaa aaaaa 675

```

<210> 71

<211> 270

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (247)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (260)

<223> n equals a,t,g, or c

<400> 71

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ctgagatgcc acaagaagca gcacagtgat cagagtgaga acaagaactc agacttggtc 60
accttcccac cggaaagcgg tgcctcggga cagctcagca ccctgggtctc cgtggggcag 120

```

40

```

ctcgaggctc ccctagagcc cagccaagac ctctagctca gccgaagagg gtgggtcagct 180
gtcggaaactt ctgaccagtg ctggttgccca gccctccaga ggtgaggcca ctgagagaca 240
ggctttnggc accacttctn gggctggccg                               270

```

```

<210> 72
<211> 538
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (101)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (302)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (449)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (459)
<223> n equals a,t,g, or c

```

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<220>
<221> misc feature
<222> (521)
<223> n equals a,t,g, or c

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```

<400> 72
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tgtggctcag cctaccaaag tgctgggatt acaggcgtga ncaccatgct cggccagtca 120
gtatcatttt ttaaaaatgt agaacctggt ttgatgactc taattaaatt gtctgccaat 180
tactgaagag ctactacata ctagwttctg ggcttttagtt ctaaagccca cagcaacctc 240
atgaataaat attattagcc ccactgtata gatgagataa cagactagga gggagaagtt 300
anggaaactt gcttaatgcc tcctgttttag aaaatagctg aactggaatt cagccctgtc 360
ttccatttca ccctgcctgt gtctcacgca cagaacaccc ggggatccgc tggttcccaa 420
agcactgatg agaaccctaa tttgtcaana ttcttgggnt ccagtaaatt gtgggtccaga 480
atgggtgggtg atctgatttc atattatctg ccaggtgaaa ngtttctgcc tggcaaaa 538

```

```

<210> 73
<211> 1071
<212> DNA
<213> Homo sapiens

```

```

<220>

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41

<221> misc feature
 <222> (1010)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1048)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1062)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1066)
 <223> n equals a,t,g, or c

<400> 73
 ggcaggagggc tgccgggggagc cgggctgctg cgggagaagg ggctccgagg agtccgcccgc 60
 ggctcgctct gtcgccgggagc cgggattggg gcgcgagggc catgggagcg ctctcctaag 120
 gcggaggtcg cgggagggag gggaggagggc ccgagagagg ctgctgcgaa ggccgagggc 180
 ccgtgactgg gcgcgagggc gccggcgaggc gcggcgggc cagcaccacc atgtcgcgct 240
 cagtgtgca gccagtcag cagaagctgg cggagaagct caccatcctc aacgaccggg 300
 gcgtcggcat gtcacccgc ctctacaaca tcaagaaggc atgtggagac cccaaggcaa 360
 aaccatccta tcttatcgac aaaaacctgg aatctgctgt gaaattcata gtcagaaaaat 420
 tccctgctgt agaaacccgc aacaacaatc aacagcttgc acaactacag aaagaaaaat 480
 cagagattct gaaaaatctg gcattatatt acttcacatt tgtagatgtt atggaattta 540
 aggaccatgt ttgtgaattg ctgaatacta ttgacgtttg ccaagtcttc ttgatatta 600
 ctgtaaactt tgatttaaca aagaactact tagatttaat tataacctat acaacactaa 660
 tgatactgct gtctcgaatt gaagaaagga aggcaatcat tggattatac aactatgccc 720
 atgaaatgac tcatggagca agtgacagag aatacccacg ccttggccag atgattgtgg 780
 attatgaaaa ccctttaaaag aagatgatgg aagaatttgt accccatagc aagtctcttt 840
 cagatgcact aatttctctt caaatggtat atcctcgaag gaatctttca gctgaccagt 900
 ggagaaatgc ccagttattg agcctcatca gtgcacctag tacaatgctt aatccagcac 960
 agtccgacac tatgccttgt gaatacctct ctttgggatg caatgggaan attggattat 1020
 ctttggcttt atttgtgcca tggggatnct taaatacttg angctncagt a 1071

<210> 74
 <211> 640
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (93)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature

<222> (96)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (619)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (624)
 <223> n equals a,t,g, or c

<400> 74
 gttgcagtga gccgagatca caccactgca ctccagcccc ggtgacagag caagactccg 60
 tcataaatga ataaataaat aaataaataa tangtnacga tccattgtgg ctctctggaa 120
 acatccatgt tcacagctgg ggtctggtca gtctgcatag tggagcacac tgctaggatg 180
 catccttagc aagtgaaaaa agtgaggctc agaactgttt gtagagtata gccttttata 240
 taaggaaggc agatgaagac tggccttatga taaaggtgct aacccccaga ctagtaaaaa 300
 tgggggttccc tgtggagtag ggaaggggca gtgtttataag ttggatttct ggccatatct 360
 gctatagtac tgatcatgga actctagggg aggaaagatg ttttccttct acccatctta 420
 tgttcattgg ctgggggctcc tggaacagaa gacagatttc caaagagaaa ggcacacmaa 480
 tttatgtaat ataagtttwc catgacmtgg gagcctttat aaggaatgac cccaaggaaw 540
 tggttaaacc tgagtggttt tgtgtaagg tttaatgagc aatgaaaagc tatgggggacc 600
 tatgatagga ggatgtaanc taanccaatg acctggggga 640

<210> 75
 <211> 507
 <212> DNA
 <213> Homo sapiens

<400> 75
 ggagcttcaa catatgaatt ttcaggggta tcattcagtc caaagtactt aakatgattc 60
 ttttccgttt ccacatagac aatcacataa tctgtaaata atgactctta cttttccact 120
 ttagtcgtta gggtatacct atatatatat wwwwtgctt tactggacta atttcaacct 180
 ccagcacacc accaatgaat agcagtaata ccagcataat tgtctgcagt tctgctgaga 240
 tacgtgctct attttattgg cttggctgta ggtttttatt ttattttttg aagaggctaa 300
 tctcttacag gaaagggttc tttttatata cagtttttac atgatgaatg atttcccagt 360
 atttcataat tcatgaggct gaattcctct tgaatttatt aaatgcttcc tgtgcatect 420
 ctgtgatgat catgtttatt tactgctaga actcaagtac ctagaactgt tcctggccaa 480
 tgatgggatg taataaatac ttcaatg 507

<210> 76
 <211> 1390
 <212> DNA
 <213> Homo sapiens

<400> 76
 ggcacgaggg agtctgatgg ggagaagaag taccatgcc ctgaatgtgg gagcttcttc 60
 cgctctaagt cctacttgaa caaacacatc cagaaggtgc atgtccgggc tctcgggggc 120
 cccctggggg acctggggcc tgcccttggc tcacctttct ctctcagca gaacatgtct 180

43

```

ctcctcgagt cctttggggt tcagattggt cagtcggcat ttgcgtcatc tttagtagat 240
cctgagggtt accagcagcc catggggcct gaaggggaaat gaggcagctg ctgtgtcccc 300
acggaaacaa ccatctgggg actgctggga aatgctgtga atgcggaggg aagtgatgtt 360
tgggttctgt agctgagaga tttttattca tttttaactg ccccccaacc ccaactccaac 420
tccttctcca ccacccattc tcccaatggg ctttagaaat agattttcat ctgatattct 480
gcagaaatat caatgagact tggatatgga caggggcaga aaacactaca taggcctcca 540
aggcaaaacc agtcccagtt tctttaatgg gaagaagctg gaattcctgg tgctcaattc 600
ttagtgaccc caatcctata cccaaatcta tgatattctg ggacctcagt gattttgggtc 660
ccctcccaact tctctagttc gtcacacctc cttcccatat ccttcaaaag aaccacacta 720
gggtctccac ctacttatac aatgcggatg cccaactgtt ttttaaggga ccagaagcat 780
cccatggacc atgggggtgag tgcctcccaa gagccccctg agctcagccc tctgcctgga 840
gggctccaga cttttctgag ccctgcttgg aggcgagcat tttcactgct aggacaagct 900
cagctgttga ggacaccccc accccaaatt tcagttctta cgtgatttta accattcaac 960
atgctgttgg gttttaattc tctaattatt attattattg ttattatttt ttaggaccag 1020
ttgtagtgaa ttgctactga aagctatccc aggtgataca gagctctttg taaaccgcag 1080
tcacacatta gggtagtat taaactttgt ttagatgtac cataattaac ttggctagtt 1140
gattgtttga agtctatgga agaaatagtt ttatgcaaaa ttttaaaaaa tgccagtctg 1200
gtcagggaag taggggggtt caatgctgtt gggaaccagg aagggtgggac agccggcagg 1260
tagggacatt gtgtacctca gttgtgtcac atgtgagcaa gcccgaggtg accttgtgat 1320
gtgaattgat ctgatcagac tgtattaaaa atgttagtac attaaaaaaa aaaaaaaaaa 1380
aaaaaaaaaa                                     1390

```

<210> 77

<211> 782

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (29)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (34)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (738)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (748)

<223> n equals a,t,g, or c

<400> 77

```

gggcacgagc tcgtgccgaa ttcggccang aggnacctga gcagtctaac tactccagtt 60
agacctaaag gcacaaatgc agaattcatg accttgtagt tgtggcaggg tctaggaagt 120
cctctctccc caagtagaaa atattctctt gccattcctg aaattccaca ttcatataat 180

```

44

```

ggctgtgcaa tacatgcttc tcaataagaa aattaactgc atgtttactg tgtgctgata 240
acatcagatt tttatgttta aaaaaatctc attatggatt gagtccagcc cagctctaag 300
agaaaaagaa ggcccatatg ggagacttca stctcattat tattgccttt atccagcagt 360
gcttatgaag cccctacccc tgtcccatc cagaaacat aagactcagg cagttcttga 420
ttctggaggc ctgcctggta agataagata gtataatttg gaactgagaa cataccagaa 480
acagcagaac gagggccaga gcagaaaaat gaaaataagt ggagacactt atggatacat 540
tggtgcaaaa aaagccacgg agcccatact gggcttgata tgactttgag gggacagcag 600
attaatactt aatgaggggt aaacctgacc agtctttcta cagtgcagg ccacactgca 660
tgaatgggga gaaccaatga atccattgtc ctctgcctat tttcctgtgc acagtcacat 720
tccctcctta agaatctncc ccttccancc tttacattaa ccaagggaca ctgaatcttt 780
ca 782

```

<210> 78

<211> 278

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (8)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (27)

<223> n equals a,t,g, or c

<400> 78

```

cttctcngtg cccgtgcaaa ggctccnctg cagaagacat cctytggcag cctgctcttc 60
tgctgctcct ttgctgctg tcccatgtgc tcctgagaat gagaaccctg cctttgcaac 120
aaacctatgcc ccggtaaatg caaaaccaca tgctctgtgc cccgagagaa aacctctaac 180
cagcaaggaa aatgtattga tgcattcctc cattttggca cctgraagag agtcttggrg 240
aactgcagga gagggggaaa actggaaaaa aaaaaaag 278

```

<210> 79

<211> 828

<212> DNA

<213> Homo sapiens

<400> 79

```

gccaatcaat gagcagtata gagaatttct ggaagggaga cacaagaagc tgtagaaaag 60
ggcggcttcc agggaagttc tagggagtct gggatgaatg agaaacttat cctaacaact 120
tttgggctct ctgaattttt ttagtatct gcaagtattg tacttggtca aatatgttta 180
aggctgcagg ctgtattcta aactccttga aagtgagaac caggtttcac tcatatttcc 240
atcttttcaa cccctagatc agtgacttcc cagggaagta gtacctgcat ttggggttga 300
cctttgggtt tcccctgtac tggctcggcc tggcctggct ggaccactgg stggctgggt 360
ggctgtgacc tagccccttc tttctctttg ctctctgtgc aaatgagagt gttggtctga 420
acgatctcta aagcctggaa gaggagcaga tcctctgtgc tcagcccca ctctgtgtca 480
gggaggcctg gcaaccacag tgttctttct cctgtttatt tgttcttga tcttctgaa 540
gccatttcac caccagcctt catcttctct gccagcccca tggagactca agctttttcc 600
agcctatgtc agggaaggag aaccagagac agcaacctcg ggtgtgaagg gagtcagctc 660

```

45

```
tgaacccagg actatggcct tctgccactg cctgctttcc tcttgctgct ggggcctagg 720
tctttcttgct gctgcttccct tttccgctaa tcaagagtcc agggagggtgg gaacagcctc 780
aacaaagact ttgaagatga gcggggagga tcgcttgagc ccaggagc 828
```

```
<210> 80
<211> 342
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc feature
<222> (198)
<223> n equals a,t,g, or c
```

```
<220>
<221> misc feature
<222> (215)
<223> n equals a,t,g, or c
```

```
<220>
<221> misc feature
<222> (319)
<223> n equals a,t,g, or c
```

```
<400> 80
caagttggga agaactgata tcttacggat actgttaaag agaactaaat atggcctgag 60
aaggactccr tattttctata tttgartcct tgtgggtgaa ccaaaaccta gcttaatagg 120
tagacaatat tgaaaaccta acctagaagt atgcacctgt aacaatagct aggtcttggc 180
caatgcctgt ggccatantt cagccattca tacantgctg agtggttcaa gtctgttcaa 240
ataagggaaa caacgaggtg taaccaatcc agctgttctt taccttactt ccaaattctg 300
tacgtcattt cccattttnt gtctataaac cttcttccac ca 342
```

```
<210> 81
<211> 537
<212> DNA
<213> Homo sapiens
```

```
<400> 81
ggcttttacgg ctgcgagaag acgacagaag ggggggggacc atgttgcttc cgaacatcct 60
gctcaccggg acaccagggg ttggaaaaac cactactaggc aaagaacttg cgtcaaaatc 120
aggactgaaa tacattaatg tgggtgattt agctcgagaa gagcaattgt atgatggcta 180
tgatgaagag tatgactgtc ccattttaga tgaagacaga gtagttgatg agttagataa 240
ccaaatgaga gaagggtggag ttattgttga ttaccatggg tgtgatttct tccctgaacg 300
ctggtttcat atagtttttg tgctgagaac agataccaat gtattgtacg aaagacttga 360
aacaaggggt tataatgaga agaaactaac agacaatatt cagtgtgaga tttttcaagt 420
tctttatgaa gaagccacag catcctacaa ggaagaaatc gtgcatcagc tgcccagtaa 480
taaaccagaa gagctagaaa ataatgtaga tcagatcttg aaatggattg agcagtt 537
```

```
<210> 82
<211> 292
<212> DNA
```

46

<213> Homo sapiens

<400> 82

```
tggacagaaa attcaatcct ttatTTTTTT ctctgtaaat gcacgggcta tgagatagca 60
acaaaaaatg catagttaat ggtcatagac tttattccaa aacataattg gaaaatagaa 120
wctgagccat tgccaaatgg taaagaaatg aaaagttttc acagtgacta ctgaatatac 180
caagagcttt tggcagtact gctggctttc tgggtgatta attaggtaaa cttggaatat 240
tcccagtaaa agtttgagaa tgcataaaat tataccattt tgaaaaatat aa 292
```

<210> 83

<211> 352

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (291)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (345)

<223> n equals a,t,g, or c

<400> 83

```
ggcacgagtk aaacttgctg ttttgttctt gtgtcttgct tttggttggg atttcagtaa 60
gtttttggta ttctcaaatt ttatctaaat ggataaacta ttaacataga acataaaacc 120
caattctcca ttctattttt ctcttaggca tgaatcatatc aaaactcaat atagagcaat 180
gtttgtaatg aattgttcta ttaacaaaga ggagggttcta agatrtaaag cctcagagga 240
acaggaagga aaaggcgggt ccataaggaa gatgagggtct taaccgggga ngatgctgct 300
tgaggagggc cagagacagt tgtgggagga aatcttttca ccccnttcat gt 352
```

<210> 84

<211> 404

<212> DNA

<213> Homo sapiens

<400> 84

```
cccccccct tttttttttt tttttttttt tttttttttt tgcgattgct ttaaagaaaag 60
ctttatttac tacatacatc ctaagaatgt actgtaaatg gagcaagatc taaataaaaag 120
cttttcaa ataaagcagc taaagttaac taaaccacta gcaatgtttg aaaacagaaac 180
tctaaaactt tttttttaca tttatatagt ttgttcttaa cactaaaaaa aaaaaagttc 240
acatttcaag ttataaactt acctcagtag tgtacatgaa atgggttttg aacaatagga 300
acagataagt cccagatagg rggctcactg atacttaatt ggccatgtca ccaatgtttg 360
tttttaaggg rgtttggtgg ttgccatggt tatcattttt tttt 404
```

<210> 85

<211> 1555

<212> DNA

<213> Homo sapiens

47

<400> 85

```

ggcacaggac agtctcatga ttataactgg tccttcaagt atacagggaa tataataaag 60
ggtgttataa acatgggttc ctacaactat cttggatttg cacggaatac tggatcatgt 120
caagaagcag ccgccaaaagt ccttgaggag tatggagctg gagtgtgcag tactcggcag 180
gaaattggaa acctgggaca agcatgaaga actagaggag cttgtagcaa ggttcttagg 240
agtagaagct gctatggcgt atggcatggg atttgcaacg aattcaatga acattcctgc 300
tcttgttggc aaagggttgcc tgattctgag tgatgaactg aaccatgcat cactggttct 360
gggagccaga ctgtcaggag cmaccattag aatcttcaaa cacaacaata tgcaaagcct 420
agagaagcta ttgaaagatg ccattgttta tggtcagcct cggacacgaa ggccctggaa 480
gaaaattctc atccttgttg aaggaatata tagcatggag ggatctattg ttcgtcttcc 540
tgaagtgatt gccctcaaga agaaatacaa ggcatacttg tatctggatg aggctcacag 600
cattggcgcc ctggggcccca caggccgggg tgtggtggag tactttggcc tggatcccga 660
ggatgtggat gttatgatgg gaacgttcac aaagagtttt ggtgcttctg gaggatataat 720
tggaggcaag aaggagctga tagactacct gcgaacacat tctcatagtg cagtgtatgc 780
cacgtcattg tcacctcctg tagtggagca gatcatcacc tccatgaagt gcatcatggg 840
gcaggatggc accagccttg gtaaagagtg tgtacaacag ttagctgaaa acaccaggta 900
tttcaggaga cgcctgaaaag agatgggctt catcatctat ggaaatgaag actctccagt 960
agtgcctttg atgctctaca tgcctgcca aattggcgcc tttggacggg agatgctgaa 1020
gcggaacatc ggtgtcgttg tggttggatt tctgcccacc ccaattattg agtccagagc 1080
caggttttgc ctgtcagcag ctcatacca agaaatactt gatactgctt taaaggagat 1140
agatgaagtt ggggacctat tgcagctgaa gtattcccgt catcggttgg tacctctact 1200
ggacaggccc tttgacgaga cgacgtatga agaaacagaa gactgagcct ttttgggtgct 1260
ccctcagagg aactctccct caccaggac racctgtggc ctttgtgagc cagttccagg 1320
aaccacactt ctgtggccat ctacagtgaa agacattgcc tcagctactg aagggtggcca 1380
cctccactct aaatgacatt ttgtaaatag taaaaaactg cttctaatac ttcccttggct 1440
aaatctcacc tttaaaaaacg aaggtgactc actttgtctt ttcagtccat taaaaaaca 1500
ttttattttg caaccattct acttgtgaaa ccacgccgag ccctatgcag tctca 1555

```

<210> 86

<211> 455

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (430)

<223> n equals a,t,g, or c

<400> 86

```

ggcacgagcc agagccgact gcaaatcact gaactgagct ggcagctgct taggggtttg 60
catgatcaag gcgattttta taacctagaa gggcctggac tgtagaagca gattccagct 120
gaggcccagg cactgccttg ctgtggtgag cacggcggct ctgstcttcc ccgccgagct 180
ttctcatcag tgaagtggg tagtgacagc atgcgagggc acggagctgt cagcaggctc 240
cagagaccat ggccataaag cactgacact gacacggccc cagcaagccc ttkgggaagg 300
gcagccacca ckttgctgc tgytgtcact tactgttgct gttgatttaa ggcaaktacat 360
actcaggyt catagcttgt aaaamaaagg aaaaatgaaa agtcaccatc atcccagcaa 420
aatgtaaggm tcccctgctg cccagattgg aatgt 455

```

<210> 87

<211> 675

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (427)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (528)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (564)

<223> n equals a,t,g, or c

<400> 87

```
ggcacgaggt cgggctcgga ggaggatcca gagacggagt ctgggcccgc tgtggagcgc 60
tgcgggggtcc tcagtaagtg gacaaactac attcatgggt ggcaggatcg ttgggtagtt 120
ttgaaaaata atgctctgag ttactacaaa tctgaagatg aaacagagta tggctgcaga 180
ggatccatct gtcttagcaa ggctgtcatc acacctcacg attttkatga atgtcgattt 240
gatattagtg taaatgatag tgtttggtat cttcgtgctc aggatccaga tcatagacag 300
caatggatag atgccattga acagcacaag actgaatctg grtatggatc tgaatccagc 360
ttgcgtcgac atggctcaat ggtgtccctg gtgtctggag caagtggkta ctctgaaaca 420
tccaccnctt cattcaagaa aggccacagt ttacgtgaga agttggctga aatggaaaca 480
tttagagaca tcttatgtag acaagttgac acgctacaga agtacttnga tgcctgtgct 540
gatgctgtct ctaaggatga actncaaagg gataaagtgg tagaagatga tgaagatgac 600
tttcctacaa cgcgttctga tggtgacttc ttgcatagca ccaacgggaa taaagaaaag 660
ttatttccac atgtg                                     675
```

<210> 88

<211> 493

<212> DNA

<213> Homo sapiens

<400> 88

```
gtcgccctag gctgggactc tagtaggtct tcggctcagt tttggctgca gcgcccgcgt 60
agatcgcttc ggccgsgttc tacgcccggc tcaactatga gcckgtgcgc ccaggcggcg 120
gaagtggcgg ccacagtgcc aggtgccggc gtcgggaacg tggggctgcg gccgcccattg 180
gtgcccgcgc agcgtccttc ttcccgcgcg cggtgccgaa ccccttcgtg cagcagacgc 240
agatcggctc cgcgaggcgg gtccagattg tccttcttgg gattatcttg cttccaattc 300
gtgtcttatt ggttgcggtta atttattact tgcatggcca ttgctgcatt tcaacagtat 360
gctgtcctga aaagctgacc cacccaataa ctggttggag gaggtaagaa atattttgtc 420
caaaatatta ggacataata ttaaattaag atatactaaa tcaatataag aagagttcat 480
catagtttag tca                                     493
```

<210> 89

<211> 416

<212> DNA

<213> Homo sapiens

49

<400> 89

```

gtgggggatgg  tgtcgcatag  cagccgctgc  cgctttggct  tgctcgggac  catttggctg  60
gaccagagat  ccgcgtggaa  ccgcgatagg  gatctgtcag  ggcccgcggc  cgggtccagc  120
ttggtgggtt  cggtagttag  aggcctccgc  tggttgccag  gcttgggtcta  gaggtggagc  180
acagtgaaag  aattcaagat  gccacctawt  ataaactgga  aagaaataat  gaaagttgac  240
ccagatgacc  tgccccgtca  agaagaactg  gcagataatt  tttgatttcc  ttatccaagg  300
tggaagtaar  tgagctaaaa  agtgaaaagc  aagaaaatgt  gatacacctt  ttcagaatta  360
ctcagtcac  taatgaagat  gaaagctcaa  gaagtggagc  tggctttgga  agaagt      416

```

<210> 90

<211> 1467

<212> DNA

<213> Homo sapiens

<400> 90

```

ggcacgagtt  catcttcata  ttctcagctt  gctccaaatg  gtgcaaaatg  cattccagta  60
cgagaccgtg  gcttcctggg  gcagacaatt  gagtttgcgt  aacagcggat  ccctgtatta  120
aatgaatatt  gtgtggtttg  tgatgagcca  catgtgtttc  aaaatggccc  tatgcttagg  180
cctaccgtat  gtgaacggga  gctgtgtgtg  tttgcttttc  aaaccctggg  agtaatgaat  240
gaagctgctg  atgaaatagc  aactggagct  caggtggtag  atctactagt  atccatgtgt  300
aggtctgcgt  tggaatctcc  tagaaaagtt  gtgattttcg  agccatatcc  ttctgtggta  360
gatcctaatt  atcctcagat  gttggccttc  aaccccagga  aaaagaacta  tgatcgagta  420
atgaaagcac  tggatagcat  aacttctatc  agagaaatga  cacaagcacc  atatctggaa  480
atcaagaagc  aaatggataa  acaggacccc  cttgctcatc  ctttactgca  atgggttata  540
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actccacatc  agttccttct  tctcagcagt  ccaccagcca  aagaatccaa  ttttagagct  660
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tccatcctga  ggaatgggtc  gggtgtgtgt  tctaatacac  gattgcagct  ccatggtgca  780
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caagtgggag  atgcaaatat  taatacacia  gaaggaggca  ttcacaaaga  gatcctccga  1140
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aaacaaaaaa  aaaaaaaaaa  aaaaaaa      1467

```

<210> 91

<211> 1793

<212> DNA

<213> Homo sapiens

<400> 91

```

ccacgcgtcc  gatttgtccc  tattgttcta  tttttaaata  aatatacaat  cattgttttg  60
cattgaaatg  catatttgta  cattttattt  gataatatta  ttttgggaaa  ttgtaatctg  120
ttgttttggt  tgtttggtta  gggaagcacg  aagaagaatt  tacaatgtg  aataaaattg  180

```

50

```

ttaaagatta ccaatagttt cttttctgga cttgaaatag ttacgtttct aaatatgaga 240
aaaataactt tgcctaaaat ttcagtataa tgaccagggtc ttctctccat tttagagaag 300
cagtccaatg tggaacagat aagacggcag cgatccagtg aggtcaattc cccacagagg 360
aaagctatgc atacctaact taatggaagg taaactttct ttcaattaat gatgtcctcc 420
ttttctcaag gtgtccaaag acaggagggtg gtctgtaaaa ggttggaatga caactccatt 480
gtccagaaca attactgtga tcctgacagt aagccacctg aaaatcaaag agcctgcaac 540
actgagccct gcccacctga gtgggttcatt ggggattggg tggaaatgcag caagacttgt 600
gatggtggga tgcgcacaag ggcagtgtct tgcacagga agatcggacc ttctgaggag 660
gagacgctgg actacagtgg ttgtttaaca caccggcctg tcgaaaaaga gccctgcaac 720
aaccagtcac gtccaccaca gtgggtgggt ttggactggg ctgagtgtac tccaaaatgt 780
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tccaaatagt ccatttcatt aggaactttt ttgtttgaat gaatgtcaca taggtatcct 1500
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tactcagtaa taatgtggta cactgttaat ttttttgctt ttgtaaatta tattctaatt 1620
tattgccatg tttcctaaca cttgtcctac attcattctc ctgcttgtaa tgaaaatgaa 1680
aaaatcattg taacacttga tggagtgaat ttccacgcca ggcacagaat ttttttgaca 1740
tagataatth agtaaaataa aaattcagct tataataaaa aaaaaaaaaa aaa 1793

```

<210> 92

<211> 538

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (24)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (53)

<223> n equals a,t,g, or c

<400> 92

```

gccccaggat tccggcacga gganttkttg ttggttgggg gccttttggc sgntgacgga 60
gactgccag gtgtgggtcac catgttctct tccgcggtct tctttgcaa gagcaagtca 120
aaaaacattc tggtgagaat ggtgagcgaa gctgggacag gtttctgctt caacaccaag 180
agaaaccgac tgcgggaaaa actgactctt ttgcattatg atccagttgt gaaacaaaaga 240
gtcctctctg tggaaaagaa aaaaatacgc tccctttaa cgggtggattg aaaatgactt 300
tgatttataa agagaagact gagggcgggg atactgattc agaaatcctg tagcgtgtaa 360
taaaagaaga ggaaatggca tggaatcact gcctcctgtg atttgaaggc cattgtgaag 420

```

51

gaaaacaatg cagtgaaaga aagttcttca tattaggaca gatatcattg catcacattt 480
atttatcttt ctgggtattt ttatagccct taataaaaaa tattaaaatw gwaaaaaa 538

<210> 93
<211> 483
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (444)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (483)
<223> n equals a,t,g, or c

<400> 93
gggaatctat cataactagt ctagagattt ctcaccaagg gaaattttcc ttatctaaaa 60
gaggaacttc aggtctcaac cctgccagtc acacccaatt aatgtccttc acaaaaaataa 120
acagcatatg ttccctttca atttgagttc agtgagctca cagcaaaatt taccttttaa 180
ttttcttcag caaatccaag acgaatatac aaaggatgag attagataaa gatttcagtt 240
tcccgctatgc caccgctggc cgccaatttt ccaaaaaagc ctggctcctc ttttcctggt 300
cctccatcca agcccccaaa gatctctaac cagaawtaaa caggaagact cagtgattta 360
caaaagacat tttagtttta cacgtacaga aaattctacc cagcattaca gaaattctta 420
gacttcttaa aattcccggg tttnccttgg tatttaacat ttggataagg gagccatggg 480
ttn 483

<210> 94
<211> 719
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (619)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (633)
<223> n equals a,t,g, or c

<220>
<221> misc feature

52

<222> (643)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (646)

<223> n equals a,t,g, or c

<400> 94

```

ngggaattgc tgagatgaca gtgtcccaca cagcttcaaa taaaatccat ggaaagatgt 60
tgcattttgtg gaataagtgc ttacttgaaa agcatgttct tcttttattt tcttactgtt 120
aagaatttttt atttgtagga tgttttgtttt aattttaattt ttttaaggga tggggggccat 180
catgtggaaa ccagaaaatg gggaaagtgt gaactatcca gacaaagatt catttttgtgt 240
ctatatattgt ttttaatttg cctcatttca aatgtattaa acagtcccat acctggattg 300
ggtgttttgta atgggttacca aaaaacaaac aaaaaagaa agaaaaagga aaaaaaaaaa 360
gaaaataatt gtgacatgct tttatcacta ctttattttt caaataacat gtaaatattg 420
taatccattg gatttttgttt tgctaacctg ttaataaaaa tatgggacca ttatcctttt 480
aacaaggcta gaatgtcatt tttttctttt tcaacatata cctgatattt tgtggccgca 540
cattttgggt gcattattat aattckgttg actgtaatga catagaatta cacattttkt 600
gktggttaat tatacagang acattttttt canagcttga ganaanaaaa taaatagcaa 660
aatgataacc tattgactcc agtaatcagt gtttcccaat acttcataag aaataggga 719

```

<210> 95

<211> 613

<212> DNA

<213> Homo sapiens

<400> 95

```

tattcagcta ctatacagaa aaaggatgaa caaattaatt tatttctaatt tgagccagtt 60
agacataatg catataacgt gatattttggt tcatgaaaga gttgtttttca tgtggttatt 120
gtaggggagta tatataattg tggaaaggggt atgggaagag ttgtgtatag ttagttgtta 180
tctctacaag tttgaaagt tttcccatcaa acattatcaa tataccaatg ttttaaaaaat 240
tgagtgaggg ttattatttg tatttgatga aagaaaaatcc aaataaagcc cacctagaaa 300
tagatatattt attatatatg tgctatagat atacctatat agtacaaata gacatgtgtg 360
atgcatatat acaatgttat atatgtgtat atgtctgtat acacactgag tctgtaatat 420
gtatacacta aattttgtgky amgctaacak cticagggtc tgcactgtga actcccckgg 480
agataagtaa gtccacttta gaataaagag ttctttttgag acttcagtta ctaacgtgct 540
ttaagaggta tctactttat aactgaattc tatgtcgttc atacgtagag ttacagtaag 600
ggtctagtat gtc 613

```

<210> 96

<211> 816

<212> DNA

<213> Homo sapiens

<400> 96

```

gggaaaggag gggtcaggcga gtccacgagg aggttcgagt gaagatcaaa gacttgaatg 60
aacacattgt ttgctgccta tgcgccggct acttcgtgga tgccaccacc atcacagagt 120
gtcttcatac tttctgcaag agttgtattg tgaagtacct ccaaactagc aagtactgcc 180
ccatgtgcaa cattaagatc cacgagacac agccactgct caacctcaaa ctggaccggg 240
tcatgcagga catcgtgtat aagctgggtgc ctggcttgca agacagtga gagaaacgga 300

```

53

```

ttcgggaatt ctaccagtcc cgagggtttgg accgggtcac ccagcccact ggggaagagc 360
cagcactgag caacctcggc ctcccccttca gcagctttga ccactctaaa gccactact 420
atcgctatga tgagcagttg aacctgtgcc tggagcgggt gagttctggc aaagacaaga 480
ataaaagcgt cctgcagaac aagtatgtcc gatgttctgt tagagctgag gtacgccatc 540
tccggagggt cctgtgtcac cgcttgatgc taaaccctca gcatgtgcag ctcccttttg 600
acaatgaagt tctccctgat cacatgacaa tgaagcagat atggctctcc cgctgggttcg 660
gcaagccatc cccttttgctt ttacaataca gtgtgaaaga gaagaggagg ttagccaagc 720
ccccaccca tcccactccc cttccctcmc cagatattta tgtgaaatga actgcagctt 780
tattttttga aataaaaact tttaaaaagc aaaaaa 816

```

<210> 97

<211> 577

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (38)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (575)

<223> n equals a,t,g, or c

<400> 97

```

cagaagccaa aaaggtctta aaattggaaa tagatgtntt tattgtactt cagccaacag 60
caagccaggg gaaggaacat acataaatat gacagggtcat atatgaaatt tggctctcct 120
cctatcaaaag tagcctagga gcttggagga agcctaatta actaaaacag gaaaaaagca 180
tactcatctg atgtaaaaaac tcatcagctg taaattacca acattaaacc agaagtcatt 240
accagttaaa atgtgtgggtt ttcattcttat tcttaaatag gagagggtggr cagtagtgta 300
agtaacattg ctttaaagrc ataaagcttk tcctggtaaa catgggtctaa atgagaaatg 360
cctccatctt ttcaggtaga accagatttc aggcatagct cagctacatc tgtattttgaa 420
atacaataaaa aatatttctt atgtctctgt attctctttt aaaaagaact gctgactggc 480
tcctgtctct tcagtaaacac tgattttttt ttaaagaagt gatatggttg actctgttgg 540
agaagaatga gcactagtat tcagccacaa gtgcnat 577

```

<210> 98

<211> 484

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (456)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (476)

<223> n equals a,t,g, or c

54

```

<400> 98
cttgagtcac atttgctgaa gaagttgtgt catttctctg gaagaatttc caaaattctg 60
gatttttttt tttttttgga gtatttcac agctgaaaag tgattctyac tttgagtttt 120
cttcctatat ttgtatagtg agttcccttt tccttcctct ttatccctcc tgttttactt 180
tatacctctc tattccttgc tcaaattatt gcaaaaagct ctatagaaag tcctctgtga 240
tctgactcct gcagactcct ccagatcttt ctgcccagg cctttactga gctcaggact 300
ccagctaaat caarataack atgttctcac ccagagtgc aaaatcctgc agatagggtt 360
aagacctagt gggmtcagag cagtagctac tgggaagtta aaaggaagg gttagaaaa 420
gaatgggaca aaggcacact tctgatggag atgaancact tgaaagtgag tggtgncctt 480
ggag 484

```

```

<210> 99
<211> 441
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (328)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (331)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (332)
<223> n equals a,t,g, or c

```

```

<400> 99
aatcgggcac agggaaaaag gctgagcgga gagccgtgct gcctggcccc tcctcaccgc 60
ccttccccgc acctcttggc tgtaccggga gcctctgaag caccggaaat gaagggtttt 120
ccaggccttg ctcttcaacts catccttcag gggaactttg aagccatgga gacatctggc 180
tttgagacca tggcgattcc cctgccactc tccttgctgg gataaagcca gggcgtggca 240
tcctgggatg atgttccctg ctgctgagtg tgcacacaac ctgagctcat cctgtgtacg 300
tcagctacac atgctcgcac ctaatttncc nnaacaacct agccagtact attgcttctc 360
ctcctcttac agatggggag atgatgacat atagagggtta acttatcaga gaccacacaa 420
aaaaaaaaa aaaaaactcg a 441

```

```

<210> 100
<211> 524
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (510)
<223> n equals a,t,g, or c

```

55

<400> 100

```

aaagaaaacg aaaaagaaag cccaaggcaa agaaggggga aggaaaacaa acttcgccac 60
tctytcttct ccttcctaac cctttgtyta gagcaccaca ccgctcacia actctttcca 120
aatgctcagt tggctcccaa agttggagcc tggcatgggc akggagccca caaaactcta 180
accaaactgg akgtctggcat gggagaartg cttctggttc actcttcta cctctccct 240
cctaaccctc tccttgccctg acagggagcc cctgtggcct ggactctagg ggatgccgcc 300
accagaaacc cctctgccaa tccctamctt gcaccctggg aaytgagta acttattctc 360
aaaggcttta aacacagaga tcctctcagc ggccgtgggc ctgccccctg tcctarccct 420
tgccacgttg aggggtccaac ctccaaggga caggcaactgc cccaccaacg gcaaattcaa 480
aattctttca aaaaaaaaaa actgaaaacn caacccaaaa aagc 524

```

<210> 101

<211> 614

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (355)

<223> n equals a,t,g, or c

<400> 101

```

ggagaagggt tctctctcat ctccctctcc agcaaccttg gccatggacc agccggctgg 60
cctgcagggtg gactacgtct tccgggggtgt ggagcatgcc gtgcgggtga tggtttctgg 120
gcagggtgctg gagctggarg tggaggaccg gatgacggct gaccagtggc ggggagagtt 180
cgatgctggc ttcatagaag atttgactca caagacaggg aacttcaaac agttcaacat 240
cttctgtcat atgctggagt cagccctcac tcagagtagt gagtcagtca ccctggacct 300
gctgacctac acagacctgg agtccctgag gaaccgaaga tgggggggccc ccagntcctt 360
ggccccccagg tcggccccagc tcaactccaa gcgctacctg atcctcatct actccgtgga 420
gttttgacagg attcaactacc cgctgccccct cccgtaccag ggcaagccag accccgtggg 480
tctgcagggc atcatccggt cactgaagga ggaactgggc cgctgcccc gtccctgccc 540
tggccccgct cctcctgctg cccctggggg tctcaggtgt gtgaggccct gaccctgccc 600
tctccccagg cagt 614

```

<210> 102

<211> 544

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (5)

<223> n equals a,t,g, or c

<220>

56

<221> misc feature
 <222> (6)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (10)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (12)
 <223> n equals a,t,g, or c

<400> 102
 cnaanntgan anaaccctca ctaaaggga caaaagctgg agctccaccg cgggtggcggc 60
 cgctctagaa ctagtggatc ccccgggctg caggaattcg gcacgagaga aaaattattt 120
 gtatataact ttaaaaggag tagaagggtt ttttgcagag ttattacgtt tgaagtatac 180
 tttatttctt gaaaaaatta cagatttttt gtaaataatg atgtaattca actctcaaaa 240
 tttttcctac tgtttcttta ttccagttgt attcacatgt gaaagcatgt gatcagttat 300
 tgctgcatta aaaacatgag tcttttttat taggtggcca ttatttatga tcttttctat 360
 gaaagagtaa ggacattaaa atgtaagatg catgatgaaa aattaagtga agaggctctt 420
 tatggttaat ttatatgaa taatgcatta ggtaggtgtt cagagtaata ttttgcgttg 480
 tgagaacatt ttttaatttta tttaaaatta aatgaaaata aattagtata ttattgtact 540
 aatt 544

<210> 103
 <211> 1887
 <212> DNA
 <213> Homo sapiens

<400> 103
 ggcacgagag gaaggaactg gtttcgggga gccctgggcg gggcggctgt ggggaggaag 60
 gtgacgtgca ggggaccaga ggctctgcac tgctcctagg acagctcatc tgtaatcaga 120
 aaaaaaataa ataaaataca gaacgctgac tcttcctgta gacagatcgg ggaccttagc 180
 actttaatcc ctcccttctg agcgctcggg gtgcactttt agactatagc tgtttcattg 240
 acgtgtcact ctccatccag tgtccttgat gtggctttta gagacttagc agaaaattcg 300
 acacaagcag gaacttgatt ttttaagaaa aaatattaca ttttgaggac attttgacaa 360
 gtaggggaag agagggcttc tgttggtttg ttttggtttg ttaactaaac ctgaagtatt 420
 aattccacaa agacactgtc cctcaggacc actcaggtag agctctgcca gggacagagt 480
 ctgctagtgg gaggtctcag gtggggcggg gtgttctgtg ccatgaggca gcgacaggtc 540
 cagatggatg tcgtcaccac ctctcctcagc tctcatcacc tggctcgtacg ccaggcccac 600
 ctcttcccag caagggacgc caaagaactg cagtttttat tctgagtctt aattttaactt 660
 ttcattcatc tttcctattt tgragaattt tttgtaatta aaagcaatta ttttaaaatg 720
 tgcaagccag tatctcacia ggcattgatt tctgtggaat ttatttttat tcaataaacc 780
 atatttatct ccaggctgtg gaatcgccac tttctttgtg aagacagtgt ctctccttgt 840
 aatctcacac aggtacactg aggaggggac ggctccgtct tcacattgtg cacagatctg 900
 aggatgggat tagcgastgt gggagactgc acatccggac ctgcccattgt ctcaaaacaa 960
 acacatgtac agtggctctt tttccttctc aaacacttta ccccgagaagc aggtgggtctg 1020
 cccagggcat aaagaaggaa aattggccat ctttcccacc tctaaattct gtaaaattat 1080
 agacttgctc aaaagattcc tttttatcat cccacgctg tgtaagtgga aagggcattg 1140

57

```

tggtccgtgt gtgtccagtt tacagcgtct ctgcccccta gegtgttttg tgacaatctc 1200
cctgggtgag gagggtgggc acccagcccc gagggcagtg gttgctcggg gccttccgtg 1260
tgagttctag tgttcacttg atgccgggga atagaattag agaaaactct gacctgccgg 1320
gttccaggga ctgktggagg tggatggcag gtccgactcg accatgactt agttgtaagg 1380
gtgtgtcggc ttttycagtc tcatgtgaaa atcctcctgt ctctggcagc actgtctgca 1440
ctttcttggt tactgtttga agggacgagt accaagccac aagaacactt cttttggcca 1500
cagcataagc tgatggtatg taaggaaccg atggggccatt aaacatgaac tgaacggtta 1560
aaagcacagt ctatggaacg ctaatggagt cagccccata agctgtttgc tttttcaggc 1620
tttggattac atgcttttaa tttgatttta gaatctggac actttctatg aatgtaattc 1680
ggctgagaaa catgtttgctg agatgcaatc ctctcgtgta tctgtatgta aatctgtgta 1740
tacaccacac gttacaactg catgagcttc ctctcgcaca agaccagctg gaactgagca 1800
tgagacgctg tcaaatatacag acaaaggatt tgagatgttc tcaataaaaa gaaaatgttt 1860
cactaaaaaa aaaaaaaaaa aactcga 1887

```

<210> 104

<211> 253

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (226)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (228)

<223> n equals a,t,g, or c

<400> 104

```

agattttgaa cttaaattat attctatatg tgtatcttcc taggcaaaaag ctgtaatttc 60
cagagagacc attaggaaca ggtagtatct atttlyctcc attatttatt tctagaaact 120
cataaaatgg attgtatttt tctataagaa caaaatatta attaaggat agatgactga 180
ccaagggstt aatcaaataa aatgactaac agcatctatc cataangnca cacaagcctt 240
atgttctcat ctt 253

```

<210> 105

<211> 705

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (671)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (688)

<223> n equals a,t,g, or c

58

<220>
 <221> misc feature
 <222> (698)
 <223> n equals a,t,g, or c

<400> 105
 cccaatctct agctagtggt gcttatcaaa taaatgcatt ggccaacaat gtactccagt 60
 tgctggatat ccaagcctct cagcttcgga gaatggagtc ttccatcaat catatctcac 120
 agactgtgga tattcataag gagaaagtgg cacgaagaga gattgggtatt ttgacaacaa 180
 ataagaatac atcaagaact cacaaaataa tagcacctgc gaatatggag cgccctgtaa 240
 gtatattcgg aaacctatcg attacacagt tctggatgat gtggggccatg gtgtcaagtg 300
 gctaaaagcc aagcatggaa ataaccagcc tgcaagaact ggcacactgt cgagaacaaa 360
 tcctcctact cagaaaccgc caagtcctcc catgtcaggc cgggggaacac tgggacggaa 420
 tactccttat aaaaccctgg aacctgttaa acccccaca gttcctaata actatatgac 480
 cagtccgtct aggcttggaa gtcagcatag tccaggcagg acagcatctt taaatcagag 540
 accaaggaca cacagtggaa gtagtggagg aagtgggaag ttcgaggaaa acagtggtag 600
 cagtagtwtt ggcwttcccw ttgctgtgcc tacaccttcg gcaccayta ttttgaaacc 660
 atttgttgat ngttccaatt tccaccgna ccacttttca ccaa 705

<210> 106
 <211> 920
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (920)
 <223> n equals a,t,g, or c

<400> 106
 gctagaagtg gattggagcc tctttgatgg atttgcagat gggttaggag tggctgaagc 60
 catttcctat gtggaccctc agttcctcac ctacatggca cttgaagaac gcctggccca 120
 ggcaatggaa actgcccttg cgcacttgga gtctctcgca gtggatgtag aggtggccaa 180
 tccaccagca agcaaggaga gcattgacgc tcttcccgag atcctgggtca ctgaagatca 240
 tggcgagtt ggtcaggaga tgtgctgccc catctgctgt agcgaatatg tgaaggggga 300
 ggtggcaact gagctgccgt gccaccacta tttccacaag ccgtgtgtgt ccactctggct 360
 tcagaagtca ggcacctgcc ccgtgtgccg ctgcatgttc cctccccccac tctaaagacc 420
 aaggccgttt actcctggtc tgattatttt ccccatctga aatccacaat actgcaggag 480
 ccctcttgaa attaacaatg gaaataaaac caatcagtca gttagcctaa acctattgat 540
 tcctcgtgat tttttccaat gtgaaaacag ttgtgtatga ttgcattaaa aatcatatca 600
 tcttttagag gttagaaaag ggaaaactaa actttctaaa tgctacttga gattgcagta 660
 agaagatacg ttttctaacc tgaaagttaa atcgcatattg ttttcttcag tagaatggga 720
 atgtgttgct gttacttgta atgtcaagtt tatctgttaa atatgtccaa aaggcaaaat 780
 catttttgtt gcatgttatg ggtcgatgtt cctgtaattg cagtgccgta aaagcttatt 840
 aaagttgttc ttttggtttt aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 900
 accccggggg ggggcccggg 920

<210> 107
 <211> 466
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (1)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (7)
 <223> n equals a,t,g, or c

<400> 107
 ngggccntac tcggggcgctc ccagargggag ccacctctca gtgcctcamc tccccctgcc 60
 tcccagcctc cgcagatgag gttcctgccc cttcctcctc gtaacccaaa ccctcactgc 120
 tcccaggacg gtcttatttta taaaccagat acatgttctt agtctgggtcc cagaccaagg 180
 agctgggtcag acggccctttt ctaatcctac atgttgagct tatgtaaaaa atgttgtttc 240
 ctctgttttt tggttcctttt cttacccaca aaccattact acttgaaact taaaaaactc 300
 gccaaagtgt aaggctaaaag agaagcagtt tgacggacct tgtgatttgt actgtttgct 360
 gcggagctat ttaaagatttt tggaataaat atacaaaact acggttgtga aataaaaaact 420
 taaattgtat attttgaaaa ataaaacact gaaaagaaac aaaaaa 466

<210> 108
 <211> 323
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (111)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (113)
 <223> n equals a,t,g, or c

<400> 108
 actatttttt tatttttataa atctttgtag aaataagcaa tgaaatacta ctttcatctt 60
 ttgaaatggg atttttcaag gcagtgtcct tttggcatta aggtaggggg ncngttaata 120
 ttctctctgc cttgtttcca cgtggaatca atattaaagt catggacatt ttaaaatctc 180
 aatttaattt cttcttattt actatgcagt atagccgtgg aacaagtaat gtagattttag 240
 ttttctcatc ttcaaagtc ctagatcacc tacctcacag ggttgttgtg gggrtwaata 300
 aaactttatg gragcaaaaa aaa 323

<210> 109
 <211> 448
 <212> DNA
 <213> Homo sapiens

<400> 109
 ttttttcaca gcatattaga aatgtttatt aagaataatg gcatgaactg cttttaacaa 60

60

```

tttagaaaag acccattccc cccgcccsc cccgccccca gatccagggc acttcctcta 120
agtaaayaca aatattttctg tagtgaactg tatgcatatt cccactgagt aaagggttata 180
agaagcctca ggtcagggtct taccacaaaa cttgaaaaca cttggaatgc agctgggcag 240
ggacttgagc aggtttttgtc ttgataagca ggtaagaatg gcagaacact ggcttattgt 300
caaccaatgt ttttttatat acctgaagta ttcacagcaa cttatttttaa gaagcttttt 360
aaaagttcta cacctccacc cccacaactc cccaatccag aacatggaac aagggtgtgg 420
agccgtttga tggacttggg tctgttcg 448

```

<210> 110

<211> 849

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (32)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (33)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (39)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (841)

<223> n equals a,t,g, or c

<400> 110

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ggtgactccg tctcaaaaaa aaaaaagaag gnngtaccna cagtatacgt gtggggcactt 60
gtgcttgagc ctgtattaaa ggaatcaggc caggcacagt ggctcacgcc tgtaatctca 120
gcacattggg aggctgaggt gggcggatca cctgagggtca ggagttcaag accagcctgg 180
ccaacatggt gaaaccccat ctctactaaa aatacaaaaa ttagctaggc ggggtagtgc 240
atgcctgtaa tcccagctac tcaggaggct gaggccggag aatcgcttga gcccagagag 300
tggagactgc agtaagccaa gatcatgcca ctgcactcca gcctgggcaa cacagggaga 360
ctccatctca aaaaaaaaaa aaaaaaaaaa aagacattca acttgaggct cctgttagtt 420
aagctatctt ctttcacttg aagcagggtt gagaggccta ggccagaatt taaattcctt 480
ttatgaatag atttcccttt cttcctgacc ccaagggtcag aggagactat atattccatg 540
gctgcctcta agactaggaa taggaatatc tgaaaacagc atttctaagg gtggtaacca 600
caggtcgatt ttaatacgag tcctttttct tgtagaggta agtaaaatct tcctgacaag 660
gtagtcctct tttcacggca cagacaatgg gctttctgtt tatgaggggt gagaagtgat 720
gtttgttact atgttctcca gcaagtaaac attcctctgc tcacctcca acaagactaa 780
cagtcctttt agaagtaa atattcaaga caaacgagaa aatcctggct acccaagtcg 840
ngtatatac 849

```

<210> 111

61

<211> 876
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (871)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (876)
<223> n equals a,t,g, or c

<400> 111
aaaaaaaaatt tacaaaaaaaa caamcacama aaaawtatct ttttttaggcc agagttttct 60
acagggtatta atgaatatatt ttcttaatcc ttataagttt tatgtgttta atattttctta 120
ataccggtag cattaattta tacttttgta gcaacacaat atttttataa acagccgggtg 180
cttggtctaa gtcttcacga ggggttttagg cagggccatc ttggggaccc tgtgtaccat 240
gtactgtatt taaaaaaaaaaa aaaagttacc tattgtcaca cttgctgtgt taattaacaa 300
aagatgttgt gtgcgggtctc ctgtatcggg gtggatccaa cagctctcca gggagtcaca 360
ttgcatgggg gttgagttga cggttcttgt gatatgtaaa ccccgagac caaacttgag 420
gggtttattta ggggttttctg tttgtccttt ggggttttgt ttcactttgt tttggtgccg 480
tttctccatt tacagccaaa tcagtttcat gatgttccaa acattttactg atgtcaaattg 540
gaggaaagga acagaaaaaa agattttttac aaagtaataa aattttaaac tgagctgttt 600
aatgttgctg tttttacctg tctgttcttg tccaaaagtg gaacattccc agggagaaga 660
ggaagggtcc actcgggttct ttaagtcgcc aaaagcccca gcccgggatt cagtacctcc 720
cctgcccccc gaattcttgc agcactatct cccagttggg tgatgccaaag gcaaaaagat 780
aacttttaac agttagagag gatcagttgc ttaaattgatt tcatgtcagt gttgtattta 840
tgggttttaca ataaaacaac ctttaggaaa naaaan 876

<210> 112
<211> 382
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (100)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (105)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (341)
<223> n equals a,t,g, or c

62

```

<400> 112
gcctcccagg ttcattgcat tctcctgcct cagcctcccg agtagctggg actacaggca 60
cctgccacca caccgggcta cttttttata ttttttagtan agacngggtt catcatgtta 120
gccaggatgg tcttgatctc ctgacctcat gatccgcca ccttggcctc ccaaagtgt 180
gggattatag gcatgagcca ccgtgcccgg ctattttcag ttcttatgt gtgaaccact 240
ttgccttgta gctttttcta tctttccaaa atcctcactc tgttcattgt ttgtctcagg 300
ggaaaaatctt cccccaccga gcttgtaaaa aaactttaat nattgggtgg aggataattt 360
aggatgggta tttattggag gt 382

```

```

<210> 113
<211> 1070
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (334)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (882)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (961)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (1018)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (1070)
<223> n equals a,t,g, or c

```

```

<400> 113
ggcacgaggg ccgactggac tttgtgagct ccagctgcta cagttgactg agttcaggct 60
ccatgtagct gggatatact acatgggtac ccctcaccct tatggagctt ccaaaagaga 120
ccctccctca aagcacagcc ccttctctga gtgcaataaa tggccatcag aggtcagtc 180
caggtgttag gcaggcatct atgaagctgg ggatgatagc actgacttca gtgcttggac 240
gagaaccagg agagagtgtg tagaaaaagc acagccagcc tcccataaaa ggacagaytc 300
ctgtgacaac cttgtcactc tgttcctccc tgantactct ggggaggtgg aggccagtg 360
gcagttctaa agtcagcag gtttgagacc attgggtgtg gactcctctc ccagtgttcc 420
tcctgggtgt tcacagatgt tattgaaatg cacactggga accctgcaca ggtaaaacta 480
aggytttatt ggcgtgattg ccaaaggcca cacagggtgg tttggyagag ctgggattag 540
aagcccagcc tgytctytc cagtagtaat ggagtcctgg gaggtttact aggcttttagc 600
ctcaatctgt ggcggcaggg tccacagccc tggggagtga cacagtcatg gtccccatga 660

```

63

```

ttggccagga cctgtktgga gagacacagg agacaagacc ctgctcttcc aggccagaag 720
ggaggggagc cccagagctg ggcagtggca tgccccacag cctggccacc tgcttcggct 780
acgcaccatg cagcagctgc acctggctgc ctcgggaaaa ctctgacctc tctgggaagt 840
ggagccagtg gctctgtggg cgtcctttcc tgcagcctgg anagcaaagc ggctttccct 900
gggactgtgt ggctcctgtc ccaactggcc tccccattcc acattcccat tgctggacca 960
ncaccaggac tgggcacagg gcttcctttt gctgattcat tcccccccta actcatcnaa 1020
attgaacccc atctgattcc cacatgctgg ccctgaaacg gtacaaagggn 1070

```

<210> 114

<211> 371

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (360)

<223> n equals a,t,g, or c

<400> 114

```

gtctattaga aaacggctct aagagattct ttggtgtttg gcactttaag gtcacgttg 60
ggcagaagtt tagcattaat agttgttctg aaacgtgttt tatcagggtt agagcccatg 120
ttgagtcttc ttttcattgg ttttcataat attttaaaac tatttggtta gcgatgggtt 180
tgttcgttta agtaaagggt aatcttgatg atatacataa taatctttct aaaattgtat 240
gctgaccata cttgctgtca gaataatgct aggcatatgc tttttgctaa atatgtatgt 300
acagartatt tggaagttaa gaattgatta gactagttaa ttttaaggagt atttgaagtn 360
gggtgggggg g 371

```

<210> 115

<211> 581

<212> DNA

<213> Homo sapiens

<400> 115

```

tttttttttt tttttttttt ttttyttgagt attccagcat tattttatttg atcagagtaa 60
aatacacttc ccatcactac aaactgagca caactacagt tgtctacaca ttcataatttt 120
tgacgtgcca acatttttgca ttctacatga aacattttgg ttaaacaataa tcttaagaat 180
tctctatttt gtttcccatc ttccctcctg ttctctccca tcttccaaag atgttttata 240
ttaactgcta tgagatttat ttgccggtca cgtaatacgg aggacagcag ggaacaacac 300
aagatttacc atgcctaggg gatgaatggc aaacccaact ttggctaatag tcattgagaa 360
caacttgga agcgtgasag gaggatatct catggaagtg ggcagtgaac ctacatttcc 420
atttatcaga agcaaacatg ggaagggtac atacatgatg aagtattgga agttaaaagac 480
ttaagacaca aaatcactaa tttaaaagra cmtgcmacmt grgtatcaac ttgctatgta 540
gkgtagcatgt aaatgaccca aatattcacc tctagcatcc g 581

```

<210> 116

<211> 705

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

64

<222> (681)

<223> n equals a,t,g, or c

<400> 116

```

atcggacggg cttaacatga aagcctatag gtcattcttg ctctgggac tacaggcagg 60
gtaggcacag gtgcagccta agaagggaac ctgcttcttc tcccttccaa agacagtgc 120
agctgactga gggcaaagag caggcaccac tcagaacgtg gtgagtacag ctcagctcag 180
cactcagtca gtggttaactt gtgccagcc ctgtgctagg cgctgacatt aacaggagca 240
accagggccc aattcctggc cttggagctc aaatctttcc tttgattttt gctcctgac 300
atcaaggccc cagtggcaac catgtggtaa gtggccaacc aagccctacc cagggtcacc 360
caacacactc tgccttgagc ctctcctcag ggtctattcc ttgctggat tatgtggccg 420
tagcatgtta cagttcaaac atgtctccac taccctgtta agagcagcct gggaacgtac 480
aggccatcaa gactatttat ttaaatacaa aaaaagggga aaacacacac acggaaaaaa 540
aattgtaagc actttttttg taaaaccaat gtctgttttg ttacatacct ttcatgtcgt 600
gctttgtaaa tgtcttattt gtgtaataaa gttaatgcaa gtaaaaaaaaa aaaaaaagat 660
gggcgaagtt atcccttggt nggtaattag tttgctgcgc gttta 705

```

<210> 117

<211> 1196

<212> DNA

<213> Homo sapiens

<400> 117

```

gcgaccgcct cgcgtaccgc gcttgccggtc cagcagcgag cagccccggg gtggcgatgg 60
ggtcgcgcgc aggcagcgga ggttctgcgc gcgactggag gttggcagtg ggccggagaa 120
agaggaaggc aggcgcggct gggcctcggc ctctggcgcc gcggtaccct ttgtctcggc 180
agcctgacgg ccccgccggg ctctccggag aggggaacgg gcggcgaggg tggcggtcc 240
tgggcgcct gtgctgcggg gccgagaggg gctcgggtcg cggcgggatc ggccggacca 300
gacagggtta atggaagagc ctggccagtc ccgcgcgggg ccccgcgagc gacagccttg 360
gccgcgggga ctggagtcct gagggggaga agcctgccgt tctgaaggct cgggacttct 420
gccccaaaga cttcgcccgc gagaactgcg ggtgcactgc ctcagggaag aagttgagaa 480
ttttgccagg tcatctctgc cagggcacag ttcactactg tgtgtttagt gtgtttcgg 540
gaagctctcc aagtgtgttg aatcagcgtg cctagcctca aggggtgcac gtgaaaactg 600
aaaccaaagg aatgatacag gcctgctttg tgtgtgtctt ccacttttaa gcttgttttc 660
agtacaaata ctcttgcttt aaacctgatt ggactgtggc gagcggacat ctgttcaaag 720
gaggggcccga gaccacagta ctctgaagg gggcttgata atgtggaaac attttaagtt 780
ttctctccgg actgttttgc tctctcaatt caggcaagtt actgaagtac gttttttatc 840
tagaaaaagg tttgatgtag tctgtaaatg gtccctgtaa agtacattgc catctcagaa 900
ttaaagatc cactctcatt tattatgcag aagttagtgg tcattctttc ctgtagatag 960
tttatctcat gtaaagaccc acccagcttg gtttaaat ttttctcact gacgtataac 1020
catcagcttt gatacttcca ttttcaggct cagactttga atttaaggaa actaaagatg 1080
actttatttt cttttctctt gggttttttt ttccaaaaac aaaaaataaa tccattacat 1140
gttaacataa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaacggacgc gtgggc 1196

```

<210> 118

<211> 975

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

65

<222> (794)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (845)

<223> n equals a,t,g, or c

<400> 118

```

tgtccctttt tattctagag gcttttcctt taattcagag attagtggag ataataacgt 60
cagtcaaggc taatgtggta catggaactt gctaattggag gttggacatt ctgtttcagt 120
cttacatgga tattgtttca ttggtgttga ggaagaaaaa aattagatac taccatgcat 180
tgggacagca taattctaata attacattga atatggcttt ttaaaaaataa gtattaaaaa 240
gccaatcggt ttctccattt atctatcttt tttgtttgtt ttaattttgg ttgattgata 300
tgcacccagg ccgtcttatt ttactttgtt aaatgtctgt ctaggaagaa ctgtgattgg 360
aaaggaatta attattatac aaataaatct ggtaggatat gagtggagta agtttgcttg 420
aaacagaagt atatttttcta ctttgaatca cctcaccaga gtcattctgtc aagaattatg 480
tataacaatt tatcttttatt gcctacatac aacatacttt ttctgaatta agataacttc 540
tattttgtgag ttgaacttca ttatctgcca ttttgtggaa tcaaccttac attyttttgg 600
ggractagag ctgattgtca ccacaagggt atatgacaac tctgttctar grcttatacc 660
yattatatag ggktatacct tttttcttat gcctcagctc tgtacctgac aatttatgat 720
tcagtggagc caagctagaa ggaacaaagg tcatctaaca ctgtgatggg gatgaattcc 780
tgagttttac ctgnacaatg aggtgggtgcc ccggaattca caacagagta gtgatagagc 840
ataangatgg ctgctccaga tgactcttgg gtttaagtgt acttgtgatt gaacaagatt 900
tttatctatg aagcttgatt ctacaaccaa aataatagaa atgggggggg ggggaatcat 960
gtctgcttat gctttt                                     975

```

<210> 119

<211> 331

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (331)

<223> n equals a,t,g, or c

<400> 119

```

catatattag tgtgctttga agttgactga aagatatact ggatatcata attatataat 60
ttctaaatag atttcttttaa atccatgcta tgttttcttt ttcagtcagg tcctacagaa 120
tgactattgc acttgggtcta ttgttttaata agtaaatttt gttattaatc tcctatgtgt 180
taaacgtggg taattgtatt atgttaatac atacttaggg aggaaaagca ggtggatgta 240
aatcagtgat tcccaacttc agcagatggw tagcmgtggg aggggtatcct tggagctttt 300
tgtaaatatt tccaaaaaag gggggggggg n                                     331

```

<210> 120

<211> 233

<212> DNA

<213> Homo sapiens

<400> 120

66

```

tcgacccacg cgtccgcccc cgcgtccgca aaactgagag ggataggaaa gaaaaactta 60
tccaggaagg aaaattggat cgaacatttc acctctcata ttaagtctgg caatgatgac 120
tatatgtatt cctgcctaaa taaatcatct attaatcatt aaaaaaaaaa aaaaaaaaaa 180
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aagggggggg ggg 233

```

```

<210> 121
<211> 2043
<212> DNA
<213> Homo sapiens

```

```

<400> 121
ggcacgagca gccctcggcc ccaccctac gaccagccct tccgtcctgc ccaccccggc 60
agcgactggg gtccctgaag acacataaat ccgggagcag ctctgtgctg agcctgcttc 120
accgctatgg ggaccagcac gggtgcgct tcgccctccc tgcgcgtac cagtttggtt 180
acccaaagct ctccaggcc tctagggtaa aaggctaccg cccacagggg ggaggcacc 240
agctcccttc ccacatcctc tgtcaccaca tgaggttcaa cctgaaagag gtacttcagg 300
tcatgccttc tgacagcttc tttttttcca ttgtccgaga cccagcgggt ctggctcgtt 360
ctgccttctc ctactataaa tccacctcat cagccttccg caagtcacca tctttgggtt 420
ccttcctggc caatcctcga ggtttctaca ggctggggg ccgtggggg cactacgctc 480
gcaacttact atggtttgac tttggcctgc cttttcccc agagaagagg gccaaagag 540
ggaatatcca tccccccaga gaccccaacc cccacagct gcaggctctt ccttctgggt 600
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aaa 2043

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<210> 122
<211> 2877
<212> DNA
<213> Homo sapiens

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<400> 122

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cccgtggaca gagtggaaacg cttggaattc acagctcatg ttctttctca gaagtttgag 360
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ttaaacctaa ctgtccgaat tgacatcatg gagaaggata ccatttctta cactgaactg 480
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68

<210> 123
 <211> 681
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (101)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (223)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (224)
 <223> n equals a,t,g, or c

<400> 123
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 aaaacagagg aacttcccat catcctcgca gaaatagtgg aacatctcct ggtgcctcgg 180
 gcaatgtagc ctcttttctt tttggactgc acctcagagg ctngtagag ctttggattt 240
 tctccaccag attccgcaac agcgagttga acctgattgc gttcttctctt acggaagttt 300
 tgcagagggg acatttgaaa aatccacatg atgtttcccc aatctgagtg atgcatttga 360
 ggcagaaatt gtgcccacag tcgatgggtga cagggttctg cagaatgtcc aggcagatgg 420
 ggcagatcac ttctctcttg agtttgttca caaactgccc actggccatg acagaacaac 480
 agggctgttt caagactgta ggaagctgtg ccaagtctgt aggagccccg gagtccactg 540
 tggatactgt ttctaggaag ggagaaggga gtcagagaaa gtggagggtca gagattctgc 600
 ccaattagtt agaagagcag agagagagga aaagaagagg gagaaaaaaaa taaagaaatg 660
 atagaaaagc gtaaaattta g 681

<210> 124
 <211> 606
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (34)
 <223> n equals a,t,g, or c

<400> 124
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 tgcttaatga aaatgtcagt tctaatagta actgattcac ttctgaacag aagtgatttt 120
 aggcatattt cttaacatat atcaagcaaa gtcctgttaa aagatctaaa tgaagaatgg 180
 agacctcagt gattaaagat attttgtttc tgaccttgag cagattgctt acctgttctc 240
 tagactataa cccaacatgt aaaaaaaaaa tgaagatggg gatgaggaaa gtgagatata 300
 tatatatata tgtattaygt ttctagcact tttccctttt aaaaagtga aatattcctt 360

69

```

tacatTTTTtg aaaaatatat tTycagtyct gaaaaatgta gcagaagtag tgaaaatgyc 420
atatTTTTaaa tGttgattat tagataaatt taacctgctt agggTTtatt gtaactacac 480
ctttcagacg tGtgTTTTygg agtagtggaa ttgccagcca ggccctgtgg cttggaaagg 540
catcccagaa atcctcggcc agaaggtgtg gcttgTtaaa gcattgagat tcmgagtatt 600
ttggtt 606

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<210> 125
<211> 1211
<212> DNA
<213> Homo sapiens

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<400> 125
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caggagatct cgggtgctgaa ggagctcaag gagcagctgg aacaagccaa gagccacggg 180
gagaaggagc tgccacagtg gttgcgtgag gacgagcgtt tccgcctgct gctgaggatg 240
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gggcagctgc caaggatgtg cacaggctcc gaggccagag ctgtaaggaa cccccagaag 360
ttcagtcctt cagggagaag atggcatttt tccccggcc tcggatgaat atcccagctc 420
tctctgcaga tgacgtctaa tcgccagaaa agtatttctt ttgttccact gaccaggctg 480
tgaacattga ctgtggctaa agttatttat gtggtgttat atgaaggtag tgagtcacaa 540
gtcctctagt gctcttggtg gtttgaagat gaaccgactt tttagtttgg gtcctactgt 600
tgttattaaa aacagaacaa aaacaaaaca cacacacaca caaaaacaga aacaaaaaaa 660
accagcatta aaataataag attgtatagt ttgtatattt aggagtgtat ttttgggaaa 720
gaaaatttaa atgaactaaa gcagtattga gttgctgctc ttcttaaaat cgtttagatt 780
ttttttgggt tgtacagctc caccttttag aggtcttact gcaataagaa gtaatgcctg 840
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ttaacatatt ttgtacaata ttaaaaaaat gcacagaaac cattgggggg gattcagagg 960
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ggtctcagat gcccagtga gccactaaca tgagtgaggg gagggctgtg gggaactcca 1140
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aaaaaaaaaa a 1211

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<210> 126
<211> 881
<212> DNA
<213> Homo sapiens

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<220>
<221> misc feature
<222> (7)
<223> n equals a,t,g, or c

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<220>
<221> misc feature
<222> (16)
<223> n equals a,t,g, or c

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```

<220>
<221> misc feature

```

<222> (34)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (37)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (41)

<223> n equals a,t,g, or c

<400> 126

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ttcaggggac acagacattc agactatagc accaagctgt agaagctaca tagttgtaga 120
ccaggggtcag caacccaaga agcctgactt ccaagctgtg cttttaactt cccaccatg 180
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ccaattgcca atcagaaaaat tggtatatct acctataatc tagaagcccc cacatcaagt 660
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gtctccctaa aatgtataaa accacgctgt tccccgacca cctggagcac atgttctcag 780
gggtctcctga gggctgtgtc acaggccatg ttcacttaca tttgggtcag aataaatctc 840
ttcaaatatt ttaaaaaaaaa aaaaaaaaaa aaaaaactcg a 881

```

<210> 127

<211> 917

<212> DNA

<213> Homo sapiens

<400> 127

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agcactttta atgaaaaatca gcctgagata aagcatcagt ctcttctcca gaaaaatgtg 180
agtaagaggg atccacccag cagtcatggg cacagtaaca agaaaaatct attaaaagta 240
gaaaaatggg ttacacgaag aggtagatcg gttagtccca aaaagccagc cagtcaacat 300
tcagaggaac attdggataa gattcctagt cctctaaaaa ataaccctca aagaagacct 360
agagatcaat ccttcagccc cagcaaaggg gaaaataaaa gttgtcaggt cagcaccagg 420
gcaggctctg gacaagatca gtgcagaaaa agcagagtcg tcgccagccc aaaaaagcag 480
caaaaaattg aagggaagcaa agctccatca aatgctgagg ccaaattatt agagggttaag 540
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aatcagacg tcatcaggaa agatgcaaag cagaatcagt tggaaaaaag cagaacaagg 660
tctccagaga aaaaaatcaa aagaatgggt gagaaatctc ttccatccaa aatgactaat 720
aagactacaa gtaaaagaagt atctgaaaaat gaaaaaggaa agaaagtaac cacaggagaa 780
acaagttcta gtaacgataa aataggagaa aatgtccagc tatcagaaaa gagggtgaag 840
caagaacctg aagagaagggt agtttcaaac aaaacagaag atcacaaggg gaaagaacta 900

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71

gaggcagctg tacaaaa

917

<210> 128

<211> 1287

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1142)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1233)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1265)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1271)

<223> n equals a,t,g, or c

<400> 128

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tttaaaaacc cctggagggtt ttaaccttgt gatgccttta tgaatatcct gttgaaatat 60
ccttccccct atgccttata aaccagagaa agccctttga agccttataa tgccaatgga 120
agatacttag aagtaaacaa aatagagagg tatatgtaga ttttcttagg tcattagttt 180
gtgtctttgt ctggtaggct gaaactactg tcatatgact ctctccctgg ccagatttta 240
atagtcatac taatactgat gtgaatcctg ataattaaac tatcttgtca ttacatttgt 300
agataaagtt ttgggttagaa atgattttgt atgtgttagg tatggtaata cagtctcaaa 360
taaaagggtca tgttaagata aaagggtcatg cttacttttt aattaatttg tgtaataaaa 420
tttaggtctt tggaaaactt atttttcaaa taaatgaacc tttcaaataa aaaagagaat 480
tagtttaacc tttatctcat ttctattat aggggtattg aatggacaag tttgactagt 540
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gnaattggaa agcctaaacc ccagtgaatt tccaaaataa rgaatttggg aaattataaa 1200
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ttttnaaaat nacaattgtg atgaggt 1287

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<210> 129
 <211> 603
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (391)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (517)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (580)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (602)
 <223> n equals a,t,g, or c

<400> 129
 cgcttgggct tggcgggtat aggttgccagt gagccaagat ggtgccactg cactgcagcc 60
 tgggtggctg aacgagactc cgtctcaaaa aaaaaatcta aatctgacat ttgatgctat 120
 ttttattaat attggaatgt tctgtcctga actttattca atataatcaa gaataaagat 180
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 gcagttgtwc caatagttgt gartggctcc nagtcmttt argagtcctt ggaartwctt 420
 ggtacacatt tgttggctgt wccttaaagg aartggcaar tccagtttgt tcyctctacc 480
 aactaract gccactgaca agtttgggtc tgttggnttc aaaattttgt aagccatttt 540
 cacaagtaca aagatacatt ttaacctgtt cttctccaan attactgagt aggaatttta 600
 tnt 603

<210> 130
 <211> 532
 <212> DNA
 <213> Homo sapiens

<400> 130
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 ttttcttttc tttttttttt tttgacaggg tctggctcta tagtccagg ttagtacagt 180
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 tgtagagaca gggtttcacc atgttgccca ggctgggtct aaactcctga gctcatgtga 360
 tctgcctgcc tcggcctccc aaagtgtctg gattacaggc atgagccacc acatgtggcc 420

73

catttttttct tcataagtga gtttgtagtt ttacttttgt tctaattttt tgaggctatg 480
 ttcaggaagc catcacagctt gaataagtaa ccatctcagg agaaaaaaaa aa 532

<210> 131

<211> 776

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (630)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (669)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (769)

<223> n equals a,t,g, or c

<400> 131

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 tctcatgtct gtggtatcag cattacaaag tgctcccac ttcaggctga caaaaacctg 120
 ggctctttta aatcgaaaag aagactacct ttgagaaatt ggataacctga tgtcgaaaga 180
 agrtaattac aagcggacac gggaatatat ccgargcctg aagrtgggtc caagtattcc 240
 ctatctagga atctatcttc tggrtttaat ctacattgrt tctgcatatc ctgcctcagg 300
 agtaatcatg gaaaatgaac aaagatccaa tcagatgaac aatattcttc gaataattgc 360
 tgatttacaa gtttcctgca gctatgatca cctcaccacc ctgccccatg tgcagaagta 420
 cctgaagtcc gtacgctaca ttgaagagct ccagaagttt gtggaagacg acaactacaa 480
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 tcttgccagg cctctcgtct gctccgggtc tgcgagggtc agccggaggc acctgtcctg 600
 acacatctgt tgctggcagc ctccccacan ctccagtgcc cagacacagg gaagagccac 660
 agcctagga acaatatgga tgtgttcagt tgagtgttag ttgaggagta aaagtgcgac 720
 atttccttc ggagaaaggc aagggcacct acttgacga cagtgttent agagtt 776

<210> 132

<211> 689

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (348)

<223> n equals a,t,g, or c

<400> 132

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 agaagaccta gtttcaaact ctgagtcaat ttctaattca ctgtgtgacc ttgtacaagt 120

```
cacttaagct ctctgatcat tggttcaaca tctttaatat gaggagagta atgcctatct 180
caattacctc ataaaattat tgcaaagatc aagtgagttg atatgttaca aattatttct 240
aaattataag attctgtata agtgggaaggg ttaagtatac tcccatatta ttaaacaccc 300
tacgtatcac tcaggattct atatgactct gagttctcaa tttctagnaa atgggtcccat 360
ttttgctttg ttccctacaa ttctacggag tctttttttt ttwaaaggaa ggggtgtaggc 420
aaaggtaaat gggagaaaac atggaatcac ataccactct ttggtgctgc taggcaagaa 480
ttttaaactg agtttaggtc accatcgtgg acttaagggtc catatcacct cagggagaca 540
agtagagtgg gaggcattcca aaaggtaggt gattcttctc ccctctagtg aagaatacaa 600
ggtcaattta caaaaaagca ccagcagcaa ataattggaa aattaaattc ataaamcatt 660
tataatagcg tcaaaaaaaaa aaaaaaaaaa 689
```

<210> 133

<211> 555

<212> DNA

<213> Homo sapiens.

<220>

<221> misc feature

<222> (4)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (36)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (308)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (471)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (484)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (489)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (510)

<223> n equals a,t,g, or c

75

<400> 133

```

ttcntgcccg ccccatcctg tgctttggcg taggenatca ctgaagactt tctattttctc 60
cattagttca ttcatcttgg tagctagact catgaaggag ctgctgccac cccagcagat 120
ctgctcgccct tgctgcttct tcacgggtctc cacggccttc gcagagggtgt cagcaactgc 180
catgaccact tgcagcagtt ggctgtagga agtcagattc tgggtgcgtgg cctggatgat 240
ggggccgcac ggggtggagggt cagggcctgg gcgctggcag cactcgccca gctcgtcgtc 300
gtagattngg agaaaagcca agattagctg gtggaagtcg gaagtgacca gacgcagctt 360
ctggtctagg gtgctgatgt cggctgcgcc cgcaaarccc cttgcttcat gctgtgcaaa 420
ktactccgtt tctaaagcgc gtgcaattgg gcagcattct cctggcagtg nctgggcaac 480
ttcngccanc tttttcttct tcttcggaan ttggcaaagg catgggcca atggccatca 540
tcaatctggc ttggtt 555

```

<210> 134

<211> 790

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (776)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (780)

<223> n equals a,t,g, or c

<400> 134

```

gcaagaatat aaaattctga ggccatatttt agctctaagc cagaccatgt tataactttct 60
taactgaata cttcttatct atactttttt tctatatctt tccatctatc tgtaagtagc 120
ttttcccatg atctgacttg tttatatattc ctattaactg acaaagcatt taaaaacagt 180
taaaaattgt ctgcagaggc attttaaatg tcaagacatt ataaaatact ttagattttat 240
acagcaattg tgaacacctt tgacaaatga acatgtctgt tcagcctttt tgggtaccocct 300
ttttattttg cttaggtaga tcaaattcta agttgatctt ttctagcagc aggggtcagag 360
tctagtgatc gtttttaaaa tggcttagat gctacctttc ttttctgaga actcagtgtg 420
atataatcct tataagatat tgacagctaa ttttatggat tatcctaccg ggacagtggg 480
acctaagtag tttgaagacg araaattggt ttgattcaka agcaatgggt tcactagtga 540
aaggaaagat cccacgatcg taagtggtaa atgtttatat ttgttgaata actctctgaa 600
aaaaggaaat aaagtagatt agccttggtg agagggtggct taagagtgggt tttatgaatc 660
taagttttat ttgaaaaatg tgtgaacttg ttttaaggtaa atgtgagaat taataaagga 720
attgagaaga aagatatttg atcgtttttt ggaataacat ttacccaatt taangangtn 780
aactactttt 790

```

<210> 135

<211> 1408

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (116)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1364)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1381)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1393)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1399)

<223> n equals a,t,g, or c

<400> 135

```

tttgccagct ctgaatcttt attttaattg atctttttat tgatgtgtta tataaatgag 60
gaagaaaaat tttgtctgat tatgtgaagg atctttctgt acatgaaaag aagggnaaat 120
aaacttgcaa ttgaatagac tgattatagt agcactgaga cacaaaaaga ttgaccatgt 180
tgccctccag acactcatat aaggctcgtg acaccagggt gaaggcggac tatttaggggt 240
ggtaaaaggaa ttatgattgt tcttgagcca aagtaattta gtttgaatat aatgaaacat 300
accctgtaaa gactgctaga aagtaaaagg attcgtcttc agagggttga gaagggtgcc 360
ttcttagtta aaaccaaact gggaaaagta atactggata aaatattcag gataaatttt 420
gcctcagcag aatttcaaag ggcagttgtt cctctgtttc attattgaat sttcagaata 480
tagttaaaagc caaargctta aaatatgtta aatgtttcac ttataaccat aatcttttta 540
catagagcat actctgcctt cataataact aaatcctctg catgtggtag atgagtacgt 600
ttaggaaata ttgtcagtg c aattaaatgg cctacacttt aaacagtatc ataaaaacaa 660
atccttaaat atattctact tgagtcacaa aagctgaaca acagaaagggt gttttgtttt 720
tgcctttctc acagtgttgt ggtgagaatc agatgagata gtatttkgac taaacacttc 780
tgaaattgta aatatatggg ggcattattg ttcttatgtc ggcttaggag gataccaaag 840
gggaagttaa tggtcacagt gcacttatgt agctttctaa gctactcaat gtgattcttg 900
ttctctttgc tgttcttttt ctctccccc atgggtgtcct tcagagagaa aaggaatgta 960
gataaatgaa tccctgcaga tgtgtcctga catttcaggg agggacaggg tataatgatg 1020
ccatctgca aaggcagcct gtgtgagaaa aagaaatcaa ataatgtgga ttttaaaatt 1080
acaaaagaca ttcatltgca gtttatgaaa ggaaaatgta gtttggatac aaagctgatt 1140
aaattggatc aagaaatatt agaattaaat gcaaaaaata atccatgcat ttatggtttt 1200
gatttttata tattcccagc tagttgaaaa tggatgattc ccacaagaag cataactcag 1260
cttggttcct gcttaccgga gtatttcac tatggtatat attgatacat tccttccatt 1320
atggtagggt gtataccaga ggtaccagtt accggtggg atcntaattg gaattttggc 1380
ncccggtgtt ccngggganc ctttacia 1408

```

<210> 136

<211> 902

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (814)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (902)

<223> n equals a,t,g, or c

<400> 136

```

aattcggcctt tgcgagcggcc gcccgggcag gtacttataa ttttggcctt ctgcactact 60
cttttgctct tacgaacata atggactctt aagaatggaa agggatgaca ttacctatg 120
tgtgctgcct cattcctggt gaagcaactg ctacttgctt tctatgcctc taaaatgatg 180
ctgttttctc tgctaaagggt aaaagaaaag aaaaaatagt tggaaaataa gacatgcaac 240
ttgatgtgct tttgagtaaa tttatgcagc agaaactata caatgaagga agaattctat 300
ggaaattaca aatccaaaac tctatgatga tgtcttccta gggagtagag aaaggcagtg 360
aaatggcagt tagaccaaca gaggcttgaa ggattcaagt acaagtaata ttttgtataa 420
aacatagcag tttagggtccc cataatcctc aaaaatagtc acaaataata caaagttcat 480
tgttttaggg tttttaaaaa acgtgttgta cctaaggcca tacttactct tctatgctat 540
cactgcaaag ggggtgatatg tatgtattat ataaaaaaaa aaacctttaa tgcactgtta 600
tctcctaaat atttagtaaa ttaatactat ttaatttttt taaagatttg tctgtgtaga 660
cactaaaagt attacacaaa atctggactg aagggtgcct ttttaacaac aatttaaagt 720
actttttata tatgttatgt agtatatcct ttctaaactg cctagtttgt atattcctat 780
aattcctatt tgtgaagtgt acctgttctt gtnccttttt tcagtcattt tctgcacgca 840
tcccccttta tatgggtata gagatgactg tagctttcgt gctccactgc gaggtttgtg 900
cn 902

```

<210> 137

<211> 730

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (606)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (647)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (671)

<223> n equals a,t,g, or c

<220>

78

<221> misc feature
 <222> (685)
 <223> n equals a,t,g, or c

<400> 137

```
tacttcagat acactagtaa agcctgctgt attccaacta atgaggacag atatgtaata 60
tatatacatg tatatacgta tgtatgtata tatactatat atataattat actttaagtt 120
cctaagggtac atgtgcagaa tgtgcagggtt tggttaaatag gtatacatgt gccatgggtgg 180
tatgctgcac ccatcaacccc atcatctaca ttaggtatatt ctccctaatgc tatccctccc 240
ctagccacccc acccccagac aggccccgct gtgtgatgtt cccctccctg tgtccatgtg 300
ttctcattgt tcaactccca cttatgagtg acaacatgcr gtgtttgggtt ttctgttcct 360
gtgttagytt gcwgagaatg atggtttcca kcttcatcca tgwccctgca aaggrcatga 420
actmattctt ttttatgggt gcatagtatt ccatgggtgk tatgtgccac gttttcttta 480
tccagtctat cattgatggg catttggtt gggtccaagt ctttgctatt gtaaatagtg 540
ctgcaataaaa catacacatg tctttatagt agaatgcaca tgtctttata gtagaatgat 600
ttatantcct ttgggtatat aaccagtaat gggattgctg ggtcaanggg cattctgggt 660
caagatcctc naggattcac cacantgtgt tccacataat ttaagctatt ttacactccc 720
accagcagtg                                     730
```

<210> 138

<211> 524

<212> DNA

<213> Homo sapiens

<400> 138

```
gycagaggag gccactgtgc ctggtcaaga aatggaactc ttacacactg ctggtgggaa 60
tgtgaaatgg taagccactt cggaaaacag tttgacaatt tcttatgcta aaaatacacc 120
tatcagatra ttagccact tctaggtatt tacttaagaa aaaataaggc atacatccat 180
atgaaractt gtaataaaat gttctcatta tttttatttg aaatagctma aactggaaac 240
aacccaaata tccatcagca agtgaatggr taaacaaatt gtratatattg tatgcaatat 300
aacaccactc agtaatatga aaatgaacta ctgatgtttg caaaacgttg aaattcaaaa 360
taattatgct gagtgacaga atccagacca caaataatac ataatgtwtt attctattta 420
cataaagttt tagaaaaatc caaactaatc ttartttacc aaagccatac caatgggtata 480
tggggccttg ggcagkttaa acsgattatt gaaaaaaaaa attt 524
```

<210> 139

<211> 869

<212> DNA

<213> Homo sapiens

<400> 139

```
ctgattcctc ctcacatatg aaaagtgaag gttgtgagtt gttttcctct tatttaaaca 60
ttggcctatt ataactctgtg ttggttatatt ttctcctgta agcatcctga tttttctgta 120
ggaacttttc tttaaatgac acacattgcc acttgtgtag atatttttaa gttctttggc 180
taagtcctct cctaactgcc tgtcctctgg ttaggccccct ccctctccac tagtgggtgaa 240
tgcatgtgtc tgtctgatca gcatcactgc acacggaggt ctagtgagcc tcttgctaag 300
tgtcacacac actcttccca aagacgtgat gagttaaagt tgtattctga aatcatgaag 360
ccagagcctg tgccagacct tctgctacct ctcatagaat tgctctgtaa ttctaaattt 420
aaaattagaa gtagagagag ataagccatc gcccctttgc ctctgagaat tggctgctgt 480
ttctaataata attattttct aagatagcca gatagttaga aaaagatttt cattgatgac 540
atatctttaa actttcttgc atcagtattc taaattgagc aaactgaaag attttcatca 600
```

79

```

ggaaaggagc actgtgggaa gagcccagta ttcacatttt ttccccattt ttcagaagcg 660
acatttcata tataggtgcc aaaagtgaat cggggtgcgg agagtgggaa ccttttgaat 720
ttatgattgt cacagagatg gtagaaatta tgatctgact ggaaaacaat cctgtatccc 780
ctcccaaaga atcatgggct ttttttttga attaaaaagc agacaaatag actttctcgg 840
gaaaaaaaaa aaaaaaaaaa cgcggccgc 869

```

```

<210> 140
<211> 586
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (5)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (439)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (563)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (577)
<223> n equals a,t,g, or c

```

```

<400> 140
ggggnaccag cgcgggtgcg cagacgaaag ggcgtctttg ccagctgaaa gttccccacgg 60
aaaaactacc atctcccctg cccaccatgg cagacgaaat tgatttcact actggagatg 120
ccggggcttc cagcacttac cctatgcagt gctcggcctt gcgcaaaaac ggcttcgtgg 180
tgctcaaagg acgaccatgc aaaatagtgg agatgtcaac ttccaaaact ggaaagcatg 240
gtcatgccaa ggttcacctt gttggaattg atattttcac gggcaaaaaa tatgaagata 300
tttgtccttc tactcacaac atggatgttc caaatattaa gagaaatgat tatcaactga 360
tatgcattca agatggttac ctttccctgc tgacagaaac tgggtgaagtt cgtgaggatc 420
ttaaactgcc agaaggtgna actaggcaaa ggaaatagag ggaaaataca atgcagggtg 480
aagatgtaca ggtgtctgtg catgtgtgca atgagtggaa gaatatggct gtagccataa 540
aaaccctgtc aaataaaacg ggnaacattc aggccangga ccactg 586

```

```

<210> 141
<211> 614
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (546)

```

<223> n equals a,t,g, or c

<400> 141

```

aaataaaaag gcagtggccc caccacattt ttttcagcat agtagctggc attttggtat 60
cattagccag agtagcttca gcatataagt tattgatgtt ttccaacttc aaaagtgcac 120
tttatcctcc cagtaaattt gataatgatt tgtcacagct ttgtcatctt ttgacttttg 180
cttatggggc tcacttcgta caactataac atgaaaaagg attgtcctaa agtaagggaa 240
tcagttaatg gtaggatgaa gaaactgtaa aaactcctag aaaaaaaacc tgtgtgcatt 300
tttctggaaa gttttcaaac tgtgtaattc agttttcatt caattatata atttgggtat 360
atgcttttaa aaacatttgt ctaaagtgtc ccgggtttct tctgggtctta gagtcagctg 420
agtgtctggc atgcagccac tcgtattttt gcatccagaa aggagtaact ccccttatat 480
gaagrttttt tttttaagct tagatgctat gtaaggagaa aactatttgt aatcacatag 540
taccnngggr ggggagtgrr ggatgctttt ttaaaaaagg rtatttaagt atattatgta 600
atttaaatat aaat 614

```

<210> 142

<211> 574

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (19)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (522)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (574)

<223> n equals a,t,g, or c

<400> 142

```

ntgttaagtt ctgacattng gagaaaatac attacaaaga acaggagctg gtttttggtt 60
ttccttggtg ctgtgttttt gaattgaagg gatgtgggat ggtggtgaca gaagtctgag 120
catagtttct gaataattgg aggggagatg ggcattcttt gggactatgt ccgcattaca 180
ttgagttttc tccctctagg aagagagagt ttgtgtttta ttttctgtaa gtaaaagcta 240
catgtttagg attttttaaac catattaatt gttatatatt gtatttcata attatattat 300
gtgttagtgt gtactggaat aacatgtttt atttgggttag ttggtgcaaa agttttctaa 360
atctactgct gtattagaaa ctgaaaaggg agggaaattc cagatgtttg atgggaacat 420
cactggtgaa tatctaggrr tggtaagtag acycaagggt gaagragtaa ggtgggggta 480
acccttaata ttaccttkgg tatatgcccg ttttttagcac cngaatacac ggggtccttt 540
gttccccaac cttaacagca gcccctgtct ggtn 574

```


81

<210> 143
 <211> 2012
 <212> DNA
 <213> Homo sapiens

<400> 143
 tatgcaagct cgaaattaac cctcactaaa gggaaacaaaa gctggagctc caccgcggtg 60
 gcggccgctc tagaactagt ggatcccccg ggctgcagga attcggcacg agtgtagagc 120
 tcaaagaaat ctgccaacat gtatgtggac tcttgagagg tgggctttcc cagtacatgc 180
 taaacagact tgttatgcc aagaggaagt aatagaaatg atagcatcaa atatccaaac 240
 tgacaggaag tttcttttgc atagcataga acatggttgt cttctgagtt ccactaatgt 300
 tccaggatat cttggccctc tgcctctggc tgcctcctgg tgtttggcac catagcgttg 360
 tcacttacaa ccattgcctt gggacacaca gagtgaactg tttgagtgat aagtaattta 420
 ggtagaaact ttacccttaa tttcaaata taccaaacag ctcttacta cccaaggga 480
 cgctctccgt agcttctgga ttccccagtt tcttctctaga aacaaggact ccaatagcac 540
 tataacccta aacaggccct aaccagaag aatacaccac aaaatgcgat tgattttctc 600
 aaaatatcac agtcttagac actatacaaa taattcaaga aaattctttc taccctgcag 660
 tggatatagt attctattat attctccagc aaaactttta ggacttttca aactcatttc 720
 taagccaaat agtttagata aatattttacc cttatatttg gggggaattc aggtccacca 780
 tttgccgagg caagcccatc aacagtctag aggcataattc tgtgtcattc cttcccgctc 840
 ccttcataga atactacttt ttctttttgt ctcttgcca ttctccatca tctgctgatt 900
 attgctaacc acaggatgct ggcaaagctt acagtgatag gcacatgtgt tcagtgtgt 960
 ccaatacact cttatcacag tggttattgc ttcttactct tttcaaatac attattctac 1020
 ccctcaacct atatccaatc attagaacta tacctgactg gagcccagaa cttgggacca 1080
 atacttaatt caaatagcag gggcttgctc acaaacatta agcccaaaaa gaagcacagc 1140
 actttgaaaa gtcaaataag cttttggtag ctctgtacat ttgcaatttt acattttgta 1200
 ttagtttata gcactaataa cacttcagtc gtgaatctac agtctcaata tgataagtct 1260
 tagaacatgt tctagaaata gtggtacctt gctgctatta tacttagtaa cttatacccc 1320
 aatataataa taagtattaa atacagattg tgtatgcatt ctttgtgtgt atatgccaac 1380
 tgtactactt aacctcactg atgagcaatt agaaaaatac acaaattgtc atagtgaaaa 1440
 taagtcttgg tcaattcaga tgatacgtga acctgataaa tgctctaata gatatgctat 1500
 tttgtcctgt attgcttgtt ttacagtatg gtgcatgttg tttgctaagt aaaatgataa 1560
 taataataaa gtataccaat ttttaaggta gaattaaaat tttgcacata tgcttcttga 1620
 tattctgaaa tgtattctgt ggcttaatta tcttattcat acacatttca ctttggcttt 1680
 ttacccttag gaaataactg tccaagtata tatctogtct tctttcttgt aactttgatt 1740
 aaactgctta cttcaactta caacattgta aagccagaat acctcatttt aacagtga 1800
 aaaaatatga tgacctgatg tgttctcttg tatttgattt gaactacct aataggctta 1860
 actgtaataa taaatataca attttggcag gcattttttc ctttgttttg atgaacattt 1920
 tgttatttgt ccacttctaa ttttgtctta aagagttata aactcagtgt caataaaaaca 1980
 tcttgttata taaaaaaaaa aaaaaaaaaa aa 2012

<210> 144
 <211> 558
 <212> DNA
 <213> Homo sapiens

<400> 144
 aagttttttt ttaccccatc ctagtgagtt tgaaagtggg cctgaccaga atgtctcttt 60
 cccatttttg cccgtttgaa ttaaataata tgtctactct ttaaaggctg aaggggtggg 120
 tgaggggatt gtttctcatt ttgtctocca agtcattttt ctgctgtgaa atatgaccag 180

82

```

gcttgtagga agactcatct tggagaaaat gtgaagtaat caaattgctt gagattagtc 240
tcctattgta tattagagcc aaaacacatr ataacttttg caacagggag ttgtctagac 300
tcaattttca gaggtcccat tgtagtgagt taatattgct aatcatgtca atcacttgac 360
akggaaagtca gtggcaaatc tttaaagtat gcatttgata ctggcaaata tatactactg 420
atgtttcaca aaagaatctt agaatctgta gaaaacatta attacttcca tgaattattt 480
ctaaagtata acttttaaagt tttgattttt ctattttaa ataaaagcyat kgatgkgttt 540
agcakgtccc caaataga                                     558

```

<210> 145

<211> 1026

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (182)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1007)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1014)

<223> n equals a,t,g, or c

<400> 145

```

gcatttatat cctgttaagc attaatagct aatcactggg acttgaattc tgatggcaga 60
tagtctcttg cttagtgaga tggagttaac tatttttttag taggaagtga gaacagctga 120
ttttcatgcc acgtttcata gccccacttt tggtagacta ccaccacgct kcttcgcgta 180
anagtyggca tcttggaat gaatgcccg cgcctcgtgg gttggtgcaa agaagtataa 240
acatatatca ctaaggaaaa agaaagtttg tcttgccctt ctgacacagt gtgtgcactt 300
caggcaattt ttggaaaata taaaaaattc caawttctgc ctttcagcag catcaattgc 360
taggaacatt tcattcattt ccctgtaata ttaatgttct ttaagcataa tactaatta 420
taagttgtat cctatttttt tccagcttaa tttctgtggt ttattgaaaa ccaagtataa 480
atgtgactaa aagcattttg ctttggtttt atagttaact ttcytaaggt tatggacatt 540
twataatgta acatttgatt ggccctggcct cttgacaatt cccttctagt tatgcatatc 600
ctccctgttg cccacatttc ttgtttttaa actcagtttc ttgttttcca gttgttgcta 660
tgtataacac ccatcttgaa agagagtata taggaagtta ttcagataac ttttgtagta 720
gtgatattca actatagcag taccttaact catgatgagc ttaggaacat aaaagataat 780
tgttgcttga atagcaccct cagagatact gacctaatg gtctggggtg gagatctggc 840
atggtagttt ttttcaagct ccaatcatcg gccagacagt tgctttatgt aggttttttaa 900
atgccaaagg cagatatgaa gtagatttaa ttaagacttg acttcagcaa tacaggggaa 960
cttaaaatac ttrtttttct ttaaactgca ggagtcactg ttaggtnttg cttnaaaaaa 1020
ttgcat                                     1026

```

<210> 146

<211> 521

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (440)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (474)

<223> n equals a,t,g, or c

<400> 146

```

gggacctggc aagcggcggc tgcagggcag gtccaggggc cacatggctg aggggggacgc 60
acggagcgcac cagaggcaca atgaggaaat tgaagcaatg gcacccattt atggcgagga 120
gtggtgtgtc attgatgact gtgccaaaat attttgtatt agaattascg acgatwtwga 180
tgaccccmma tggacacttt gcttgcasgt gatgctgccs aatgaatacc cagggtacagc 240
tccacctatc taccagttga atgctccttg gcttaaaggc caagaacgtg cggatttatc 300
aaatagcctt gaggaaatat atattcagaa tatcgggtgaa agtattcttt acctgtgggt 360
ggaggaaaat aagagatggt cttattacaa aaatctccag gtgacagAAC caggcccaga 420
tgttaaagga ggaaaactgn aggaggaaga tgtttggaatg tggaagggtg atcnccattt 480
ttagcatggt cagccgggaa agttcgggtt aaaagcattg g 521

```

<210> 147

<211> 557

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (17)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (527)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (543)

<223> n equals a,t,g, or c

<400> 147

```

ggattaacca ttaaatngat tgaaaaggaa actttgcacg gtatgagctt cataccccca 60
ccaaacaaag tcttgaaggt atttatttta ccaagtatat ttttaaagtt gttttataag 120
agagactttg tagaagtgcc tagattttgc cagacttcat ccagcttgac aagattgaga 180
ggcccatgcc aacagtctaa tctaagagat tagtctttca aactcaccat ccagttgcct 240
gttacagaat aactcttctt aactaaaaac ctagtcaaac aaggaagctg taggtgagga 300
gatctgtata atattctaata ttaagtaagt ttgagtttag tcaactgcaaa tttgactgtg 360
actttaatct aaattactat gtaaacaaaa agtagatagt ttcacttttt aaaaaatcca 420

```

84

```

ttactgtttt gcatttcaaa agttggatta aagggttgta actgactaca gcatggaaaa 480
aaatrgttct ttttaattctt tcaccttttaa agcatatttt atgtctncaa aagtattaaa 540
aancttttaa tacaagt 557

```

```

<210> 148
<211> 1023
<212> DNA
<213> Homo sapiens

```

```

<400> 148
ggcacgagga accaccttct gtaggacagt caccaggcca gatccagaag gcttgaggcc 60
ctgtgggtccc catccttggg agaagtcagc tccagcacca tgaagggcat cctcgttgc 120
ggtatcactg cagtgttgt tgcagctgta gaatctctga gctgcgtgca gtgtaattca 180
tgggaaaaat cctgtgtcaa cagcattgcc tctgaatgtc cctcacatgc caacaccagc 240
tgtatcagct cctcagccag ctctctctta gagacaccag tcagattata ccagaatatg 300
ttctgtctcag cggagaactg cagtgaggag acacacatta cagccttcac tgtccacgtg 360
tctgtctgaag aacactttca ttttgtaagc cagtgtctgc aaggaaagga atgcagcaac 420
accagcgatg ccctggaccc tccctgaag aacgtgtcca gcaacgcaga gtgccctgct 480
tgttatgaat ctaatggaac ttctgtcat gggaagccct ggaaatgcta tgaagaagaa 540
cagtgtgtct ttctagtgtc agaacttaag aatgacattg agtctaagag tctcgtgctg 600
aaaggctgtt ccaacgtcag taacgccacc tgtcagttcc tgtctggtga aaacaagact 660
cttggaggag tcatctttcg aaagtttgag tgtgcaaatg taaacagctt aacccccacg 720
tctgcaccaa ccacttccca caacgtgggc tccaaagctt cctctacct cttggccctt 780
gccagcctcc ttcttcgggg actgtctgcc tgaggtcctg gggctgcact ttgccagca 840
ccccatttct gcttctctga ggtccagagc atccctgctg gtgctgacac cctctttccc 900
tgctctgccc cgtttaactg ccagtaagt gggagtcaca ggtctccagg caatgccgac 960
agctgccttg ttcttcatta ttaaagcact ggttcattca ctgaaaaaaa aaaaaaaaaa 1020
aaa 1023

```

```

<210> 149
<211> 1256
<212> DNA
<213> Homo sapiens

```

```

<400> 149
gctcagcctc ccaaagtgtt ggtattacag atgtgagcca ccgcacccag cctgagtttc 60
tctttctctc tttttaactt tattttttga aaaaccgggt agactttgtg gggagcattt 120
ttgttgataa ttactgatc taaagctgag tgatttttta aaagaatttg aatctaatag 180
atctgtgggt gaatttsctg tgttggtatg aagtccaccc tgtgggcaca ataacataac 240
tgttggtagg agttgtttga gctattctgg agattatttg gttaaagtata ctaaaagcct 300
taaaaccatg tatgtgcgct gtttgaacca gtaagccact tctttgacat tagaagacat 360
tagaagaaat aatcagcctt gcataaaact tatggatgaa agtattcatc acaatattat 420
ttataataaa aaattgcaaa tgttataaat gaacaattgg gaaatgggta aagaagtgat 480
ggtgcattgt gtggtagaat attatgcata tgttttaaga atcatatttt ctaagattat 540
ttggaagcat gtttggtaat gtcaagtgga gtaccccgaga tacatttttag acatttatcg 600
tcatcatctg ctctgagtgg aaggccgttc agagaggcta gaggttctta ttctggctat 660
aaattatgtg agtaaaattg tgctaaccag ttaaaagtac tgtacacca tgctcaatat 720
atagtccctg aaatagcaat tgaaacatgt cttctcaca gagaaaatga cagttttaat 780
gatgtatttg atgaatttaa actttaagtc aggtgctgca aattggaaag aagacttgtg 840
gtgttttaag ttgctgtgga cacttttaag aaacttagaa cccatggaac ccttgtttat 900
cgccatgcaa attacaatct tgaatgagtg ttttttaaaa ataaagtatt agaaaaatgt 960

```

85

```

gtagtaaaga tgtaaaatta aaaaatggaa ttctccatta actgtggatt ttactaaata 1020
gaattactgg tgaagcagat ttatccatcg agactatctg gtatgcggtta tgtatgtagt 1080
ctgttgctgc tgaagatgt ctgtgtgcct gtatcaacat gtgacttcat gtaaagtttc 1140
tttgtgttca cagttcttag caaatgcagt tacaatccat agatagccag cagtggatgt 1200
tactccagga aaatgcagga ttaaaattgt ctttgtgtaa aaaaaaaaaa aaaaaa 1256

```

```

<210> 150
<211> 698
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (683)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (692)
<223> n equals a,t,g, or c

```

```

<400> 150
cctcgctcaa gccctcagag aagaacattt tcacctctt catggtggcc acagctgcca 60
tctgcatcct gctcaacytc gtggagytc tctacctggy ragcaagaga tgccacgagt 120
gcctggcagc aaggaaagct caagccatgt gcacagggtca tcacccccac ggtaccacct 180
cttcctgcaa acaagacgac ctcttttcgg gtgacctcat ctttctgggc tcagacagtc 240
atcctcctct cttaccagac cgcccccgag accatgtgaa gaaaaccatc ttgtgagggg 300
ctgcctggac tgggtctggca gggtgggcct ggatggggag gctctagcat ctctcatagg 360
tgcaacctga gagtggggga gctaagccat gaggtagggg caggcaagag agaggattca 420
gacgctcttg gagccagttc ctagtcctca actccagcca cctgccccag ctcgacggca 480
ctgggccagt tccccctctg ctctgcagct cggtttcctt ttctagaatg gaaatagtga 540
ggccaatgcc caggggttgga gggaggaggg cgttcataga agaacacaca tgcgggcacc 600
ttcatcgtgt gtggcccact gtcagaactt aataaaagtc aactcatttg ctggwaaaaa 660
aaaaaaaaaa aaaaaaaaaa ccnggggggg gnccggta 698

```

```

<210> 151
<211> 1710
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (142)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (208)
<223> n equals a,t,g, or c

```

```

<220>

```

<221> misc feature
 <222> (242)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (317)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1644)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1707)
 <223> n equals a,t,g, or c

<400> 151
 aatttcggcc cgaggggtgag ggcagctgga gtgcgttctg ccgaagcttg tggttgcacg 60
 cccttcgtct taggggctac ctcccggtgt gagtggtgac ggtggtgcac ttgggggttg 120
 ttctcgctgc gtggccgcac gnggctgaac ccttcccact ccatcccctc cccgcacccg 180
 gaccagcccc tgggacgccc tcggacgncc acccgctcca accctgggga agcctcagag 240
 tngcagcgaa ggcctyttgc ctttccgcct ctgcgcttgc tgtcatcgcc cacgtgcttt 300
 gttgttggtc ggtgcanacc atgtccaagt ctctgaagaa gttggtggag gagagccggg 360
 agaagaacca gcccgaggtg gacatgagtg accggggcat ctccaacatg ctggatgtca 420
 acggcctctt taccttatcc catatcacac aactggctct cagccataac aagctaacaa 480
 tgggtgccacc gaacatcgca gaactgaaga atttggagggt gctcaacttt tttaataacc 540
 aaatcgagga gctgcccaca cagatcagta gccttcagaa actcaaacac ctgaaccttg 600
 gcatgaacag gctgaacact ttgccacgag gcttcggctc cctgccagct cttgagggtc 660
 tggacttgac ktacaacaac ttgagcgaaa attctcttcc tggaaaacttc ttctacctga 720
 ccaccctgcg tgcactctat ctaagtgaac acgattttga aatcctgccg ccagatatgt 780
 ggaagctcac aaagtigcag atactcagcc ttaggggataa cgacctgatc tcgctgccta 840
 aggaaatcgg ggagcttacc cagcttaaaag agctccacat tcaggggaac cgcctcaccg 900
 ttctgcccc agaactagga aacttggatt taactggcca gaagcaggta ttcaaagcag 960
 agaacaatcc ctgggtgacc ccatttgcag accagttcca gcttggcgtg tcccatgttt 1020
 ttgagtatat ccgttctgag acatacaaat acctctacgg cagacacatg caggccaacc 1080
 cagaaccacc gaagaagaat aatgacaaat cgaaaaagat cagccggaaa cccctggcag 1140
 ccaagaacag ataaggaagg gattggcatc ggctggcctt ccagcacctt ctctctccaa 1200
 cacttcattc tctcttgccc tgtctctcaa ataaacccaa tgctgcgtgt gaggcctttt 1260
 ttatttttct tttactctc tttctaattg tttccacctt accttttaga ttcttttgct 1320
 aggtgggaga ttgttataag gtctttaaac catttccatt tgtttcttta acattaccaa 1380
 aagcaggga caaagctctt attcaactgc gaattccata gtgggctctg gcttttcttg 1440
 aatagatatc acaaggttgc ttattatcaa aagaataatt aaaatcatgt aaccatttaa 1500
 atgtcactgt taacactttt cactctttct gttgattcac ctaactcatt attttgcttt 1560
 attaaaagtc ttccttcacc accgagatat gctaatttaa cttacaaatg attttaataa 1620
 aatcttgagt ttgtaaaaaa aaanaaaaaa aactcgagag tacttctaga acggccgcgg 1680
 ggccatcgat tttccaaccg ggtgggnacc 1710

<210> 152

<211> 1121

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (532)

<223> n equals a,t,g, or c

<400> 152

```

ggcacgagggc agaatgggtcc tgccagccac agcagggccc tgggtggggat ttgcactggg 60
cactccaatc ctggagagga tgccagggac ggggatgctg aggaagtcag agagcttggg 120
acggttgaag aaaactgagt cttgggcaat ttgtgctaaa actaggtgag ttgccaaacc 180
caaggcatct taccaacagc tggtttgggg gctgggttcc ctggtgttgt gtgttaccta 240
ccctttggct tggcttgacc tctccttggt agctcacctg agccctccca gggccagggt 300
cctgacagtg ttggtttttg cacatccact ggaaagggtg cattaatgac ccagtgttag 360
aatgcaagag gtcagggttat tctageccctc atggctgaag gccagtcctt ggctccacca 420
ctcctccagc cagaggggtct ggaccatcca gtgcctgtcc tcgccacagg gcctccaggg 480
agcattcggg tcaawtccat ggacaccctg ggctacaaac caaggctgct gntcatccca 540
catcgtgtgg ggcagtgtcc atcccctgca gctacttggg gacttaacaa ctycaggagc 600
cctgtcagct gccctcctcc acctaaaccc cttcgactct tctgctttga caaagaaaat 660
gacattgggg aggggagggtg ctccgcctcc cagcttttct caaaatagtc ctatagatac 720
tggtaatctg gaaatgaaga agtaattctg tctctgcacc tactttttgca gaatgttcaa 780
ggaagtattc tgtgttagta ttaatgcaa aaagtgtgtt ttaaagggtt tgtactcagc 840
acatcataca aaccacatta cttctgtcac ttcagggcat cgggactggc tggcgccctt 900
gttatgtgct attttaatca gtgtaacatt ggtcaagttg ttacccatgt atgctgtgtt 960
tatcatgtgt atatcgtcya gaaagtatta aggcttttag tagatgcaac tggcgaaacct 1020
tggagagggg atgctgattg tcttgaccaa acccacagcc tgtctcttct cttgttttagt 1080
tacttacggc aataaatcat ctatgagtta gtgcaccgtg a 1121

```

<210> 153

<211> 445

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (440)

<223> n equals a,t,g, or c

<400> 153

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ttttcttgca tctgcccgcg atcttctccc agacctttct gcgagtacga gccaaaccggc 60
agaccgcgact gaatgctcgg attgggaaaa tgaaacggag gaagcaagat gaagggcaga 120
gggaaggctc ctgcatgggt gaggatgatg ctgtggacat cgagcatgag aacaacaacc 180
gctttgagga gtatgagtgg tgtggacaga agcggatacg ggccaccact ctccctggaag 240
gtggyttccg aggctctggc ttcacatgtg gcagcggcaa agagaacccg gacagtgtatg 300
ctgacttgga tgtggatggg gatgacactc tggagtatgg ggaagccaca atacacagag 360
gctgatgttc atcccctgca caggcgagga gctggttgaa gccaaaggaga gagaggcatt 420
tcggggcgca ttcttaaatn gccgg 445

```

<210> 154

88

<211> 798
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (638)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (665)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (698)
 <223> n equals a,t,g, or c

<400> 154
 agctcttaga caggtacaga gaactacaac ttagtacaga aagcaaagta acagaatttc 60
 tccatcaaaag taaattaaaa tcttttgaaa gtgagcgtgt tcaacttctg caagaggaaa 120
 cagcaagaaa tctcacacag tgtcaattgg aatgtgaaaa atatcagaaa aaattggagg 180
 ttttaaccaa agaattttat rgtctccaag cctcttctga aaaacgcatt actgaacttc 240
 aagcacagaa ctacagagcat caagcaaggc tagacattta tgagaaactg gaaaaagagc 300
 ttgatgaaat aataatgcaa actgcagaaa ttgaaaatga agatgaggct gaaaggggttc 360
 ttttttccta cggctatggg gctaattgttc ccacaacagc caaaagacga ctaaagcaaa 420
 gtgttcactt ggcaagaaga gtgtttcaat tagaaaaaca aaactcgtctg attttaaaaa 480
 atctggaaca tcgaaaggac caagtaacac agctttcacm agagcttgac agagccaatt 540
 cgctattaaa ccagactcaa cagccttaca ggtatctcat tgaatcagtg cgtcagagag 600
 attctaagat tgattcactg acggaatcta ttgcacacct tggagaaagg atgtcagcaa 660
 cttanaataa agaaaagtca gctttactac agacggangg aatcaaaatg gcattaggat 720
 ttaggaccaa cttctaaatc atccgtgaag gaaatttggc aagcaaataa aaaccagatt 780
 cctcgggtaa gatgcatt 798

<210> 155
 <211> 400
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (74)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (379)
 <223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (383)

<223> n equals a,t,g, or c

<400> 155

```

ggaatctgga agcctgactt tgccccagg gaagttgggg accgccttcc ctcctttctc 60
cacctctcac tctnggcacc ctctccaatt gcactaaagt agctgttggt ccagtctgcc 120
ccccacaagg ggggaggtct ctgcttycag tcttcttccc ccgctgcctc cgetmccacc 180
ctggacaatc tccttgtttc ccttggtgtc mtggayagct cagctttgta tgtgtgtttg 240
gggggtgggg gtgggttctg gcttgagtgg gtttggcagg ggtttgggaa gggttagggg 300
aggatggagg atgaagtctc ctacccctt ctccagctcc aggccacaga agcctgggaa 360
agggaggggtg cctactctng gtngctagtg tgtctttgca 400

```

<210> 156

<211> 1757

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (596)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (647)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (648)

<223> n equals a,t,g, or c

<400> 156

```

gccagccacc attttatctc tctaaagtct ggtcccagta ttaaacctat tcttttagtaa 60
actcatatta ctgttctaaa ttgaagaaat tattttattac tctgtacttc tagactcaaa 120
attctttatc aaagatagtc tcaaagaggt agtacaagtc ctgtttaact gcactttttc 180
acattcacag tgcttcctct gatattcttc cttacatcat tatacactgt tgatatcatt 240
ttactcttct ttctcttcta catttcttaa attttgggtc ttttctctgta catgtgtttt 300
agcggggccc ttttctttga actttgtcta attagcctgt acatttttgt ttcttttaag 360
gtagaacaga tctttttttg tttctccttt taagtctact ggtttttaaaa gaggtaaatg 420
tatccataga ccacagtgcc ttgctttttc ctctgccagc acatggagca cgggattaga 480
tgcacaaacc tatttaggga actatttttg tagatgtttg agtttatata gaaattgcag 540
ctgggtatttt attttgctgt acatttactc aacttgtcca ttagtattta actatntcca 600
gagtttgttt aggagtaaga attgacccat tcgttagttt accatanntt ttcttggtat 660
aaaaaggagc cagaaataag ccttattgct aaataattaa ttatgtaagc ccacctaggt 720
cctgcataag atccccctca catacttcac aatatatatg tgtgtgtgtg tgtgtgtgtg 780
tgtgtgtgtg tgtgtgtgtg tgtgtatktg gctaaaaaat tatactgcca aaattactga 840
ttataaatac ttgactacac tgattgatgg gacaaaatga ttaaagtatt ttcagggatc 900
ttattccata tgtcaccacc aaagatttct acagtgttat aaagtatata aatattccaa 960
atttctgtgg ttaaataattt ttttcttttt tttccttttt tagaataaca cagtctgtgc 1020

```

90

```

tttccaaaaa tgcttgaact tttatgttgt taagaaatat ataatgatat cttacattaa 1080
gcatgagtcct aattttgtatt aattgggatg gactaaatct tcatttgatt atcaggaaaa 1140
ttaaggagtt atatatattaa aagcaatctt ctgtgttttc ttctttgtaa gttgactcat 1200
ttgtgaagca attaggcaaa ttttgagaag atcattgtta ttgtggtttg cagtatatat 1260
ttcttagtaa atatcactta agattaaatt tttcagaaag aaaattatag cttttttccc 1320
aaaatatctt taagatttaa tctttttgta gtatgctaca gatttaatta tattaactct 1380
tttttaagac attgaccatg acttaacatt ttgccttcta acacctttta aatctatgta 1440
ctttaatagt taagagaaaa taagtttgca gatttttaat aatctgtttg taaaaggcta 1500
tctctaagcc tagtatgtgg gtaattttac aggtgtgttt ttgataact ttaatatata 1560
ataaactcat tttatttgtg gcaatttcgcg tttctttttt tatgccagag tacatatgtt 1620
ggattccatg aattgggtatt acttattatt atgtgttgat taaatatatg cacacactta 1680
ggattacaga tcacagagca aattatgaaa atcataaaca ttctggtatg gtcattccata 1740
ggattatgaa aaagaaa                                     1757

```

<210> 157

<211> 1245

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1245)

<223> n equals a,t,g, or c

<400> 157

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gaaaagccctg aatgttgtag aaagtgtttt gcaaataaac ttaagcaatt ctacaaacag 60
aggatcagta gctgctaaga aatttaagga catcatacat tatgatccaa cgaagcaaga 120
ccatgccact tacgaaagaa aaagagatga taagccaaaa gaaagtaaa caaaacgaaa 180
aaagaaaagg gaggaagctg agaaactacc tgaggtgtct aaagaaatgt attataatat 240
tgctatggat ctgaaagaaa tattccaaac tacaaaatat accagtgaag aggaagaggg 300
cacaccctgg aatgaggact gtggtaaaga gaaacctgag gaaatccagg accctgcagc 360
tctgaccagt gacgctgagc agcccagcgg gttcacgttc tctttttttg attcagacac 420
taaagacata aaggaagaga cctacagagt tgaaacagtg aaacctggaa agattgtctg 480
gcaggaagac cctcgtttac aagacagcag ttcagaagar gaagatgtta ctgaagaaac 540
agatcacaga aactccagtc ctggagaagc atcattactt gagaaagaga ccactagatt 600
tttctttttc tctaagaatg atgaacgact tcaaggttct gacttattct ggagaggagt 660
aggaagtaat atgagcagga actcctggga ggccagaaca accaacctgc gtatggattg 720
tcgaaagaaa cataaagacg caaaaaggaa aatgaaacca aaataataaa tgtcagctgg 780
ttttgatact gaatgtgaac aaggctcacc taaggaaact gaccagaaa acagttttag 840
ctgacaaaaga agaaatttca gagtgaagga attttaaaaa tctggctgac ggaatatcat 900
tctggttgcc atctttttct gtggaactcc tctgcatttc ttcctaagta attacttcaa 960
aaattaaatt caacttctta taaaggaaga acaagatagt ccttgaaaat acttttttga 1020
tataatctct ttgccttcta tcttgagtaa ctaatggaca tcttctcatg caaggtttay 1080
atgaagcctt tttwaataaa tgagtcaaa cacttgatct ttccagccta ggctttgtgt 1140
gaattatagg ctatttgaaa ttttatttct gattatgtca aatacacctt ccgattttgt 1200
catttttgtt taaactgata aattacaagt caacattgag ttttn                                     1245

```

<210> 158

<211> 379

<212> DNA

<213> Homo sapiens

<220>
 <221> misc feature
 <222> (375)
 <223> n equals a,t,g, or c

<400> 158
 gtgagctgag accatgccac tgtactccag cctgggcaat agagcgagat tctgtctccc 60
 aaaaaaaaca aaaaacaaca aaaaaacttg ctaccaccca gggattttct gctattttaa 120
 aggtgaatctt cttttctggg actaaactgt agctgcttaa cttagtaaag gctgtgtttg 180
 gccaggcctg tgccagagggt cacctggagt gctccaccca ctggcaggca agtcctattc 240
 ctattcaccc aggatcccca aggctgggct gggatataaa tgttgggata ggaaagaaat 300
 atttcctttt tagaggaaag caagaagaaa cattgcctga aagtgattty ctagtcattt 360
 ccattagtac agaangtta 379

<210> 159
 <211> 474
 <212> DNA
 <213> Homo sapiens

<400> 159
 ctttatcata ttttacaat gtgtgagtct gctatggatt agaaattaat aagagatttk 60
 gccacagata gtttgagaag ccagcactg ccactcaaca aatgctgggtg cattcagatg 120
 gtgaaatatt ctgcagctat taaaggagtt aaaactgcct ccacttacct ggaggcccat 180
 ctgtgacacc tttttagggtt aaaaggaaaa gaaaaacttg cttaggactg aatatgagcg 240
 gttgcaatctt gtaacaatga tgtatatata catatacatt ttcatgtatt tgtatgaaca 300
 taaaagtatt gaaggatatt catcaaactg ctaaaagggt tgcttcagag taacggactc 360
 ggagaaggca gattaatttt ctcttaatgg aactctgtat tgtatcactt gtaaaaaata 420
 gcatgtgtta tctttatgat aaaaaagtaa aaacctaaaa aaaaaaaaaa aaac 474

<210> 160
 <211> 1444
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (4)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (5)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1373)
 <223> n equals a,t,g, or c

<220>

<221> misc feature
 <222> (1425)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1430)
 <223> n equals a,t,g, or c

<400> 160
 gggnnntagac accttagaga ttcagcagca agccctgcta agagagcagc agaagaggct 60
 gaacagaata aaaatgcagg aaggtgccaa agttgactta gatgccatcc caagtgctaa 120
 agtacgagag caaagaatgc ccagagatga cactagtgat ttcttgaaaa actcattatt 180
 ggaatctgat agtgctttta ttggggctta cgggtgagaca taccctgccca ttgaagatga 240
 cgtccctccct ccaccatcac agttgccctc tgcacgggag cgcaggagga acaaattggaa 300
 aggactagac attgatagca gtcgtcctaa tgtagcacca gatgggtctct ctctaaaaatc 360
 tatatccagt gttaaattgtg atgagcttag agtgagaaat gaggaacgaa tgcgaagact 420
 gaatgaattt cacaataaac ctattaatac agatgatgag agttcactgg ttgaccctga 480
 tgacatcatg aaacacatag gggatgacgg atcaaaactct gtagcaactg agccctggct 540
 ccgccctggc acttcagaaa cgctgaaacg tttcatggca gagcagctga accaggagca 600
 gcagcagatt cctggaaaaac caggcacttt cacttggcag ggccctgtcga ctgcacatgg 660
 ttaaaataaaa cctgtactgg acccagtagt gccttttaag gtgaaaggaa tggtaaatct 720
 gtacctttta tatgtcctac ttttggcccc tacctgaaag ttactttttt tccatcatct 780
 gtatataaaa ttattttttat catgatgtat attatgtaca taaataaaag gccatgatta 840
 ttgattttata taatagaatt gtatagatta tttttgcaca gttttgtcat aaattagggt 900
 ggtaatgaac tggattgaac tactatatgt gcattatatt gaattctgct tgtcattaag 960
 ataagggtgaa taagtgtctt aaacgtcctg taaaaccgga ctcccccttg ttacatgcac 1020
 attttccatt gttacctcga tgcaaaagaa ttcatttagt aggtacatct attgtagctg 1080
 tgattattcc agtttctgtg tgatgcaatc aaatgtccta ttaattaatt attatttcat 1140
 gtcattttgta gctactgata cagcagaaat gaagggaact gtaattactt gtatttttgt 1200
 aagccatacg ttaaattgtt gttacatcat ctttctgctt ctattttttat gccaatgaag 1260
 gcattttgtct tgttactaat tacatgatgt aactacttct tgatataaat aaattttttat 1320
 tttaattact aaaatctttt taactactat ggagctttct agactagttt tcnagagggt 1380
 gaatagaggt ggggacaccc ggggagtcaa ggacagagga gactnggagn cttccttctt 1440
 ccca 1444

<210> 161
 <211> 449
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (268)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (269)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (368)
 <223> n equals a,t,g, or c

<400> 161
 aattcggcac gagttggaat gtgagatggt ggttgagagt caggatctct tttaaaagtg 60
 atcttgagca agttatttaa acttttcta atcagtttc tttatctgta aaatggagggt 120
 aatgggaata cttacctcaa attgctgaga gaattaaatg aaataattct gcaagatagt 180
 tatcacagta aagcagtaaa tgctccattc aggggtaccat tactattgac tgccttaaaa 240
 atttaattct ctagccagggt gcgaaaannc atgcttgtaa tctcaacact tttggagggcc 300
 gaggtgagat gatcatcttg agcccagag ttcaaggatt aaccagagta acatagcagg 360
 gatcttgnct ctattttttt aaaaaagtca ccttgtaaca ctggtgaatt ggataaggag 420
 caattcagat gtagcgaatt ttaataatg 449

<210> 162
 <211> 573
 <212> DNA
 <213> Homo sapiens

<400> 162
 cccaccctga aagccctgag ctttctgcta tcaaagaggt tttaaaaaaa tcccatttaa 60
 aaaaaatccc ttacctcggt gccttctct ttttatttag ttcccttgagt tgattcagct 120
 ctgcaagaat tgaagcagga ctaaattgtct agttgtaaca ccatgattaa ccacttcagc 180
 tgacttttct gtccgagctt tgaaaattca gtggtgttag tggttaccca gtttagctctc 240
 aagtattcag ggtattccag agtggggata tgatttaaat cagccgtgta accatggacc 300
 caaaattttac cagaccacaa aacttttcta atactctacc ctcttagaaa aaccaccacc 360
 atcaccagac aggtgcgaaa ggatgaaagt gaccatgttt tgtttacgggt tttccagggt 420
 taagctgtta ctgtcttcag taagccgtga ttttcattgc tgggcttgtc tgtagatttt 480
 aggaccwat gctgcttgag rcaactcatc ttagggtggc aaaaaggcag grtggccggg 540
 cgcgtggtca mgscgtgaat cctagcactt ggg 573

<210> 163
 <211> 1037
 <212> DNA
 <213> Homo sapiens

<400> 163
 aattcggcac gagctgtctg cgaagtggcc cttgattaca aaaagaagaa acacacctaa 60
 acactttatc tccaagttac aaaagtttga ggtgcagagg gaaggccaga tttttttttt 120
 aatgaaatta tatagattag atctcagtat ttaaactgtt cctcaatttt gtgaggctgt 180
 gttggaaata accgcctct agtgctgttg gtatgcaagg cagcgggtgct taatcaatat 240
 ttctgtgtgt caccagaggc aaaatgtacc aatatcctga caccattctc tctccattta 300
 cttctggtgg ttacctgac tcttgactct tagaagtgcc cgagatgggg ctaaccttta 360
 ttaaacagat cgcattattat gatcttgctg cagccacagt gcagctccac attaaactcta 420
 cagaccaaac catttgatc tggcatcact tactaacaca cgacatgcgg cttttctgca 480
 tcaactgcta tgacggttaa gaatgtcagt atacaagaag gaatagaaaa ctgatactgt 540
 tttaaataat ctgtaatttc aatttttttt tttttttgct gaaatacatt atattgtacg 600
 tttgagataa ttctagtaca aagtataata aaactagatg tataataaac ccttttaaatc 660
 attggtaagt gtacaagtgg tggaactgaa gcatttactg gacaaaagtaa tgttactcta 720
 atggttactt gctcgtgcgt tgccacactg tggtataatt tgcttcattt ccttgctatt 780

94

```

tgatacatag tgtgcatttc tctgtcactg taactattgt aatgacaaat tttcatctta 840
ctgcacaatc aaaatgacat tgataggaat gaactccaga ggctgggcct gaacagggag 900
gtggtcgctc aggcctgggtg ctcagtcgta cgacctgtac ctctcaactt ttgccctatc 960
tgttaaatat atgctatgtc attaaatgct tttaaatcta aaaaaaaaaa aaaaaaaaaa 1020
aacggggggg ggccccgg                                     1037

```

```

<210> 164
<211> 921
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (881)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (908)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (913)
<223> n equals a,t,g, or c

```

```

<400> 164
ccccccccc ccttgtggac agctgtgtta ataaggccaa ttttctgaga atgtgggaaa 60
gattaaaata ttaactgtt tatctttcac agagtagcag tagctctgat taagcctata 120
ggcaattaaa agtagtttgt ctgtaaaaag agggaaagaa ataagatttc ttacccccatt 180
ttatggactt ttaaaaatta aaaaactgcg cccccgcccc ggagctcttt tcttatgaca 240
tataaattat gacatttata ttctttatat gactttatgt tctcttctta tgacatttaa 300
attctttaag tagtttgttg gtccaataaa ctagacgttg tataatctaa attgagccct 360
tgtatatcta aaactgatga gttgtttcta aattgttgat tgtccattta cttgcctttg 420
gtattaagat aatgcaagta aagtttagta agtcattgga taatgaaatg attatgtttc 480
tgaagaccat attatatttt taatttttag aggaatcatg ccatccccca aaaaatcaag 540
aaatatttga attttaaatt ataagttcat ttgttaaaag acattttttac aaatgtctga 600
aaatcttaaa atactttaca tctaccttta agtagtagaa tacagagctg taaattttcca 660
tgcctttttt cctgatatta agttttatag taaaaaagca actagtgatt gcacaaagaa 720
tataaaaatc caytcttttt acaaagggtg gaatttaaat aacgttattg attggaatat 780
gaaaataaac caatcattta agagcttttt agcaaatgat ccaattctta ctccctttct 840
ccaagattg gaaaagcata atgtttttcc tcctaaagtt nggaatccta gaaaagcccc 900
ggtgagtnng acnaatgttc c                                     921

```

```

<210> 165
<211> 465
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature

```

95

<222> (428)

<223> n equals a,t,g, or c

<400> 165

```

aattcggcct cacagagatc atcatcttta ccaccttcaa atcgtaaadc aagtactcca 60
aaaaaaaaactt attctgagaa agccaccgat aaccatgtta atcatagctc ttgccctgaa 120
ccggtgccaa atggagttaa gaaagtatct gtgagaacag cctgggagaa gaataaatca 180
gttagctatg aacagtgtaa gccggtttca gtcactccac aggggaatga ttttgaatat 240
acagcaaaaaa ttcggaccct agctgaaaca gaacgatttt ttgatgaact tacaaaagaa 300
aaggaccaga ttgaggcagc actaagcagg atgccttctc ctggaggacg ratcacttta 360
cagamraggt taaatcagga agccttggaa gatcgtttgg aaggattaat cgagaactgg 420
ggttcagntc gcatgacgct aaagaattcc atgttttgcg cacct 465

```

<210> 166

<211> 752

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (651)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (662)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (684)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (693)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (700)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (711)

<223> n equals a,t,g, or c

<400> 166

```

gtggaaactt tttccatcct gttttctctg ctatatctgt cagcccccat ytccaccwac 60
atcagagaag acagcatcgt gaagcttctg tggcagcctc ctaaggaagg ggctgccaat 120

```

96

```

ctgtagttgg cagatgctat aggaattgct tacaaatgtc gtctttaaga aaaatgttct 180
tataatcttc ctatgggcaa aatgaaggct tgggtgctca tctaaagctc agccaactcc 240
tgaagcactc tctcagagca tactgctgct gtaatgggct ggcttaatta tcggcagagt 300
gcttgaaaag gctttgcaga cctccctgc cccaagact gggtgacttt atatgtactt 360
cattcaaggg taaatcaggg agacgttctc catttatctc ttcgtccttc ctgcctggga 420
aagtgatagc actaaatatt tcccagcagg atggggtagt gtttctcaaa ggaatcaccc 480
tttccctacc ttcagactca ttctttaccc ttccattgst ccagtgtga tggaggccaa 540
agacaacccc aggggtttca taggaaatc actggaattg tgcgcaattg tctttgtagt 600
ccttttgcct tttttttttt taaatattta tgttggaat agcatttggt ngggtatttt 660
gntttaaaag gcctcactct aagntattac cgncccttn attgggtttt naaagacatg 720
tgggggggata tagtttttaa aaaataaacg ta 752

```

<210> 167

<211> 1631

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (255)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1620)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1630)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1631)

<223> n equals a,t,g, or c

<400> 167

```

tccagagatg tttcctgtcc tccccgggtc ccacttgctg ytcaataacc ctgccctgga 60
gttcatcaaa tacgtgtgca aggtgctgtm cctggacacc aacatcacaa accaggtgaa 120
taagctgaac cgagacctgc ttgcctgggt ggatgtcggc gagttctccg aggaggccca 180
gttccgagac ccctgccgct cctacgtgct tctgagggtc atctgccgca gctgtaactt 240
ctgccgcgac ctggnacctg tgtaaagact ctcccttctc agaggatggg gcggctcctgc 300
ctcagtggct ctgctccaac tgtcaggcgc cctacgactc ctctgccatc gagatgacgc 360
tggtggaagt tctacagaag aagctgatgg ccttcaccct gcaggacctg gtctgcctga 420
agtgccgcgg ggtgaaggag accagcatgc ctgtgtactg cagctgcgcg ggagacttcg 480
ccctsaecat ccacaccag gtcttcatgg aacagatcgg aatattccgg aacattgccc 540
agcactacgg catgtcgtac ctccctggaga ccctggagtg gctgctgcag aagaacccac 600
agctgggcca ttagccagcc ccgggccccg ggtgcctctg cgtccgtgcc aggcctcctg 660
atgccaaggc cacatccccg tgcttccagt gaccagacca ctgaccaccc tgactgtcca 720
aacctgtgac cccaggccag ggaacgggga ggaaacccaa gaaaaccatt ttcaggggagc 780

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97

```

tcagacgtca caggagggag cgggagcagg atgtggccct ggccctcgcca gagcacctga 840
agaagcaggc cgtgagcgag gctgcgagtg ccctgggcgc cgtttctcac gcatgaatgc 900
ttttccaggc ctctgttgct tcctgcacca cacctggtgg ggtgggagcg tcctctagt 960
cccctagttc tttgtcctgc ctcccagagg gaggaaaaag cccctggggg cttctggctc 1020
cctgagattg ggctctgaga cgagacgggt tcccaaggcc ctggtggggc tggagtctca 1080
cctgtttgca tggagaaatg ggctggcccc acagcctcac aggagcagtt tgtgggctgg 1140
tttccccrgg aatccagacc ctaaccctgt agaactctga ttttggcttg tgagccctgc 1200
ttatttggag ccgggtctag agggaaacct ctatcagcct caggaaaaca agacctctgt 1260
gcacctcact tttggctcac tgcagccctt gtcccttcacc tccacacagg accagctgga 1320
agcagaaaga agaaaggcca atttcacagg gcaccaaaca agtatgaaat gtaaatcaga 1380
aatgcagaca cccagacga gagcctcaca ggagggaggg ggccccacag gctccccagg 1440
aggctcgtgt ctttggccca gagccagcct tagtttgtcc ctgccatcta ctgtctgagg 1500
ccatcgctgc tacactttgt ttttatttgt atttcatact gaagtttcaa maaaaaaaaa 1560
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1620
aaaaaaaaan n 1631

```

<210> 168

<211> 740

<212> DNA

<213> Homo sapiens

<400> 168

```

tttttgaatc ggttgtggcg gccgcggcga ggaatggcgg tatttgtgag aggagtcggc 60
gtttgaagag gtggaactcc tagggctttt ttgagagtgc tgatttagaa gaatacaaat 120
catggctgaa aatagtgtat taacatccac tactgggagg actagcttgg cagactcttc 180
catttttgat tctaaagtta ctgagatttc caaggaaaac ttacttattg gatctacttc 240
atatgtagaa gaagagatgc ctcagattga aacaagagtg atattggttc aagaagctgg 300
aaaacaagaa gaacttataa aagccttaaa ggacattaaa gtgggctttg taaagatgga 360
gtcagtggaa gaatttgaag gtttggattc tccggaattt gaaatgtatt tgtagtcacg 420
gactttcagg attctgtctt taatgacctc tacaaggctg attgtagagt tattggacca 480
ccagttgtat taaattgttc acaaaaagga gagcctttgc cattttcatg tcgcccgttg 540
tattgtacaa gtatgatgaa tctagtacta tgctttactg gatttaggaa aaaagaagaa 600
ctagtcagggt tggtgacatt ggtccatcac awgggtggag ttattcgaaa agactttaat 660
tcaaaagkta cmcatttggg ggcaattgta cacaaggaga aaattcaggg ttgctgtgag 720
tctagggtact ccattatgag 740

```

<210> 169

<211> 2038

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1490)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1508)

<223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1979)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1992)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2010)
 <223> n equals a,t,g, or c

<400> 169
 tcgacccacg acgtccggcg gcgggaagct ggcggcagcg gtcgggtggcg gtggctgagc 60
 agaggacccg gcgggcggcc tcgcgggtca ggacacaatg tttgcacgag gactgaagag 120
 gaaatgtgtt ggccacgagg aagacgtgga gggagccctg gccggcttga agacagtgtc 180
 ctcatacagc ctgcagcggc agtcgctcct ggacatgtct ctgggtgaagt tgcagctttg 240
 ccacatgctt gtggagccca atctgtgccg ctcagtcctc attgccaaca cgggtccggca 300
 gatccaagag gagatgacgc aggatgggac gtggcgacaca gtggcaccac aggctgcaga 360
 gcgggcggcg ytcgaccgct tgggtctccac ggagatcctg tgccgtgcag cgtgggggca 420
 agagggggca catcctgctc ctggcttggg ggacggccac acacaggggc cagtttctga 480
 cctttgcca gtcacctcag cacaggcacc aaggcacctg cagagcagcg cctgggagat 540
 ggatggccct cgagaaaaaca gaggaagctt tcacaagtca cttgatcaga tatttgaaac 600
 gctggagact aaaaaaccca gctgcatgga agagctgttc tcagacgtgg acagccccta 660
 ctacgacctg gacacagtac tgacaggcat gatggggggg gccaggccgg gccctgcga 720
 agggctcgag ggcttggtc cggccacccc rggccctagc tccagctgca agtccgacct 780
 gggcgagctg gaccacgtgg tggagatcct ggtggagacc tgagcaggag ccctgagtgc 840
 tcacagccgc ctctgacgca ttgacacgtg agcactggct cccacggagg gtgcgcctgc 900
 cgccagcggc ccagccttgc tgccctgtct gctgattctg agaaatccca gaacagccca 960
 ttaccagtgg ggctgcagcc tagggccgtc ccactcacct ccccccctgtg gagggccagg 1020
 cagaggctgt tctggaaggc ttcttgtctt ctgacgtccc cacagccctg ggcccctcgt 1080
 gtctctttgt gtccccact gtagaggacg gtgagccgca gctgcatcaa cctcctttta 1140
 cctttagata ggtgaatttt tacaattcag ttttacatgt tttgggcagt attttgtctt 1200
 aagatatatt ttttaaaactt ttataacctt atctcttttag attttttcag ctattttctt 1260
 aaaagtatat tttttctata aacatccttt gctgctacat tagaactttt atagcctaaa 1320
 caattgcagt tgggtgtgtt cattttttta aggtttaaat aagggttttt tgttttgttt 1380
 tgttttttgc agtgagcatc actacagtct cagtcaacag tgtgaatgta tcatgtttta 1440
 ctttaaatgt gtgtgtgata cttcttcatt atgtcctgcg ctgcagtgan gacctgggtg 1500
 aaaatcangg aaccgcacac agccacatct tcctagacct aagagtaaata tatggaggat 1560
 tttatttatg tctatttata tgtaaatgtc attgaagaca aagggtcaaat atttgtctgt 1620
 ttgtagatca caggcaccag ttggtcttca gggacctcat agcccctcgg tgggtgccttc 1680
 tcaaggcagt gttcctggag gctcccttca gggtcagccc atgcacctgc cctgrrtgag 1740
 gaagtagcat tgctgctgga tgagaaacgc ctgcgctgct ctgttagact ggtgctgaaa 1800
 caaaaggtta aggctaggtt gaagtctaga atgaaagaaa tctgaatcca tgtcattcat 1860
 aacccttga tctgtagtgt catgggtgct gccgcagagg aagttgagct gggggtgcct 1920
 gccagccttt ccactcctgc cccgcttcaa cccaaatgct ccctgtttcc caagctttnc 1980
 ccaaatttcc tnaaccttta accaaaaagn ggggtttcct ttggggcaaa aaggccat 2038

<210> 170
 <211> 522
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (471)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (488)
 <223> n equals a,t,g, or c

```
<400> 170
ggcacgaggt taatctaagg tgaagcaaac agaaaattgt ggagggtttt ttggtgtgca 60
actgaggaac atgggtcaag aaactaatca cagccaagtg cctatgcttt gttccactgg 120
ctgtggathtt tatggaaacc ctctgacaaa tggcatgtgt tcagtatgct ataaagaaca 180
tcttcaaaga cagaatagta gtaatggtag aataagccca cctgcaacct ctgtcagtag 240
tctgtctgaa tctttaccag ttcaatgcac agatggcagt gtgccagaag cccagtcagc 300
attagrcctct acatcttctc ctatgcagcc cagccctgtw tcaaatacagt cacttttate 360
agaatctgta gcatcttctc aattggacag tacatctgtg gacaaagcag tacctgaaac 420
agaagatgtg caggcttcag tatcagacac agcacagcag ccatctgaag ngcaaagcaa 480
gtctcttnaa aaaccgaaac aaaaaaaaga atcgcttggt tt 522
```

<210> 171
 <211> 1666
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (114)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1659)
 <223> n equals a,t,g, or c

```
<400> 171
gagtccatct tccaccgagg ccacgagcgc cttccgcatt gccagcgcct gcctggacga 60
gctgagctgc gagttmctgc tggctggggc cggagggggc ggggcggggg ccnggcccg 120
gaccgcatct cccccacagg ggtcgggtgc tggggatcct gtccgcatcc actgcaacat 180
cacggagtca taccctgctg tgccccccat ctggctcgtg gagtctgatg accctaactt 240
ggctgctgtc ttggagaggg tgggtggacat aaagaaaggg aataactctgc tattgcagca 300
tctgaagagg atcatctccg acctgtgtaa actctataac ctccctcagc atccagatgt 360
ggagatgctg gatcaaccct tgccagcaga gcagtgcaca caggaagacg tgtcttcaga 420
agatgaagat gaggagatgc ctgaggacac agaagactta gatcactatg aaatgaaaga 480
ggaagagcca gctgagggca agaaatctga agatgatggc attggaaaag aaaacttggc 540
```

100

```

catcctagag aaaattaaaa agaaccagag gcaagattac ttaaatgggtg cagtgtcttg 600
ctcgggtgcag gccactgacc ggctgatgaa ggagctcagg gatataatacc gatcacagag 660
tttcaaaggc ggaaactatg cagtcgaact cgtgaatgac agtctgtatg attggaatgt 720
caaactcctc aaagttgacc aggacagcgc tttgcacaac gatctccaga tcctcaaaga 780
gaaagaagga gccgacttca ttctacttaa ctttttccttt aaagataact ttccctttga 840
cccaccattt gtcaggggtt tgtctccagt cctctctgga gggatgttc tgggcggagg 900
ggccatctgc atggaacttc tcaccaaaaca gggctggagc agtgcctact ccatagagtc 960
agtgatcatg cagatcagtg ccacactggt gaaggggaaa gcacgagtgc agtttggagc 1020
caacaaatct caatacagtc tgacaagagc acagcagtc tacaagtcct tgggtgcagat 1080
ccacgaaaaa aacggctggt acacaccccc aaaagaagac ggctaaccct ggagtatcac 1140
ccttcctccc tccccaggca cactggacc aattaccttt gaatgctgta tttggatctc 1200
acgctgcctc tgtggttccc tcctcattt ttcttgagc tgatagctct gcctattgca 1260
ggacaatgat ggctattcta aacgctaagg aaaaaaaaca aacacagaac tgtttcaagt 1320
actcaagact gacttacaga ccaaccaacc accttgctgg aacccttgct agcaggcatt 1380
cttataaaaag aaactttcga gcctccttat attgctggaa actcagctgt gctccagact 1440
agagcctcct tacctatgct atggattttt aattttatttt ctcttatttc atgtacactg 1500
cttttttttg ttacagtgtg tgatggatgt gtatgaaaaa aatgtatctt tgggaaaaca 1560
attacagttt gttaatttga aaaaaaactc gtgccgaatt caagcagccc ggggggatcca 1620
ctagttctag agcggccgcc accgcggttg agggccagnt tttgta 1666

```

<210> 172

<211> 438

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (413)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (438)

<223> n equals a,t,g, or c

<400> 172

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gcgaggagg tgtatgccca gctgcaaaaa atgcttcttg agcaacaaga gaagtgcctg 60
ctgttctcca agcagttcat gcaccagggc aacgtggctg agaccaccgc atttgagaag 120
cttgctcagg accgcaagaa acagctggag atcctgcagc tggcccaggc tcagggcctc 180
maccctccca cccaccactt tgagttgaag acattccasa ctgtgaggat cttctcacia 240
ctcaacagca cagaaatgca tctgatcatt gtccggggaa tgaacctccc agcccccca 300
ggggtgactc ccgatgacct ggatgctttt gtgcgggttg agtttacta ccctgactcg 360
gaccaagctc aaaaaagcaa aacagctgtg gtgaacaaca caaactctcc cantttgatc 420
actcttcaac taaactcn 438

```

<210> 173

<211> 2511

<212> DNA

<213> Homo sapiens

<220>

101

<221> misc feature
 <222> (12)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (28)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (44)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2456)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2488)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2511)
 <223> n equals a,t,g, or c

<400> 173
 gtaccattcc cngaccgctt ggcctgtncg attaatccgc ccnatagga attggcccgg 60
 gccagattcg gccgagcaag cggaacctct gggaaaagca atctgtggat aagggtcactt 120
 cccccactaa ggtttgagac agttccagaa agaaccgaag ctcaagacgc aggacgagct 180
 cagttgtaga gggctaattc gctctgtttt gtatttatgt tgatttacta aattgggttc 240
 attatctttt atttttcaat atcccagtaa acccatgtat attatcacta tatttaataa 300
 tcacagtcta gagatgttca tggtaaaagt actgcctttg cacaggagcc tgtttctaaa 360
 gaaacccatg ctgtgaaata gagacttttc tactgatcat cataactctg tatctgagca 420
 gtgataccaa ccacatctga agtcaacaga agatccaagt ttaaaattgc ctgcggaatg 480
 tgtgcagtat ctagaaaaat gaaccgtagt ttttggtttt ttaaatacag aagtcagtgt 540
 gtttctgcac ttataataa agcatggaag aaattatctt agtaggcaat tgtaacactt 600
 ttgaaagta acccatttca gatttgaaat actgcaataa tggttgtctt taaaaaaaaa 660
 aaagaaatgt actgttaagg tattactttt ttatcatgctg atgattcata tctaaattac 720
 attattatgt tagctgacag tggtagtgat tttttagggtt gggtgtttttg tggatttctt 780
 tagtagtgat agtagcctga accacatttt agataactca attatgtatg tatgtgcata 840
 cacatataca aacacactaa tggtagaatg cttttttatg tgctagacta ttatatattag 900
 tagtatgtca ttgtaactag ccaatatcac agcttttgaa aaattaaaaa atcacactat 960
 attaatattt catatttgcc aacagaaaca tggcagatag gtatcaatat gttttcaatg 1020
 cctgatgacc tataagaaga aagtattgaa aagaagagag attagaactg ttagaaggag 1080
 ttgaaatttt ctaaaagaca tagtatttag ttataatta aatgcattct tgaagtccag 1140
 tgtgaatttt attaatgcta tcatctcgac caagctcaaa gcctacttat tagaaacaat 1200
 gaagttcaca ataggtcata aggtctcttc cttttctaaa attgaaagac aagaaattta 1260

102

```

gtgccaatat tgtacagaca gaaattccat gtatgagtct caacaaagac tacctttggc 1320
taaattgtcta gaagcagaga agtaaagtga gcaaaatcca gtgttgagga gtcattgacag 1380
tactttgatc tttatatact ctgaagcatt tcttcaaact tttctacttt tatttgtcat 1440
tgatacctgt agtaagttga caatgtgggtg aaattttcaaa attatatgta acttctacta 1500
gttttacttt ctcccccaag tcttttttaa ctcattgattt ttacacacac aatccagaac 1560
ttattatata gcctctaagt ctttattctt cacagtagat aatgaaagag tcctccagtg 1620
tcttggtgcaa atgttctagt atagctggat acatacagtg gagttctata aactcatacc 1680
tcagtggact taacccaaat tgtgttagtc tcaattccta ccacactgag ggagcctccc 1740
aaataactat tttcttatct gcagtattcc tccagaagag ctaaccaggg cagggtggc 1800
atgagaagtg acatctgcgt tacaaagtct atcttctctc taagtctgta aagagcaatt 1860
gaatcttcta gcttttagcaa acctaagcca aaggaaggaa agccacgaag aatgcagaag 1920
tcaaaccctc atgacaaagt aggcacaagt ctacaataag ctaaatacaga atttacaaat 1980
acaagtgtcc caggtagcat tgactcccggt cattggagtg aaatggatca aagtttgaat 2040
taaggcctat ggtaaggtaa cattgctttg ttgtactttt gaacaagagc tcctcctgat 2100
cactattaca tatttttcta gaaaatctaa agtttcagaag agaattgtatc actgctgact 2160
tttattccaa tatttggatg gagtaagttt tagggtagaa ttttgttcag tttggattta 2220
atcttttgaa aagtaaattc cttgtttact ggtttgacta taattctctg ttatctttac 2280
gaggtaaaac tgcaagctga ctagcatggt ctgtgaatct gccattccta aaaattttat 2340
aaacacttga tacttttcac tgataatgga tcgctccaat aaacatatat tgtgaaaatg 2400
catccacaat aatggaatt ctttctgca aaaaaaaaaa aaaaaagggc ggccgntcta 2460
gaggatccag gcttacgtac gcgtgcngc gacgtccata gccccttcta n 2511

```

<210> 174

<211> 230

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (4)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (19)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (227)

<223> n equals a,t,g, or c

<400> 174

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tcctntccag tgggtacttnt actaaattgt tgtcttgttt ttattttttaa aataaaactga 60
caaatgacaa aatgggtgagc ttatgatggt tacataaaaag ttctataagc tgtgtatata 120
gtttttttatg taaaatatta aaagactatg atgatgacat ttaaaaaaaaaa aaaaaaaaaa 180
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaanggg 230

```

<210> 175

<211> 1191

<212> DNA

103

<213> Homo sapiens

<220>

<221> misc feature

<222> (44)

<223> n equals a,t,g, or c

<400> 175

```

ggcagagcgg cacgagatgt gagccacccat gcctgggtgt ctctttcatt ctttaggcag 60
ttcattgtca cttccttcca ttggtaaaca tgtaaattat agtcgcata tttagaattt 120
tactgaccaa agtcataata atagttaaca gtacaaggaa ctatcttkgt ataatgggtt 180
atttaataca gtatacatta tctttcatat actttgttac aatgttaaaa aaacttcatt 240
tttcataata taggaaataa agttggaaac aactctggtg ggaatacttc agatagagca 300
agaaagcatt cacagcaagg cctataatca gtaagatgtg tgaaaagttg ggtagccaca 360
ggaggtgttc attaaggata tgattccatt tatatagcta tttctatttg ataaccagga 420
cagttttatt gttttgaggt caatgttctt ttaaaatttg attttctgta agaagaggct 480
ttttggccca gaaagcctta cttatcttac awcttccagt ttgtccatcc catgagttag 540
agttcgtctt gactctgcaa gctagaatca aagaattatg aaagtaagat ctttagatt 600
tgaccaaggg caccattaaa tgggtgtcagg ttttaggaag cagacgggtg tataaaaaga 660
aaatgaacaa agatttcact tattggggat caggcataac tggatgcctg gattgtcctg 720
ccaccagct gccaccaata aaatcattca tcaactctgca agagggacca gatgcttcca 780
tcatcagtac tccttgtttt tctgttatct cctttgaggt agctaaaaat ggcagccaaa 840
aaaaaatgtt gaggcttttc tcaagtatat actcatgtta ttttgcagaa gatagggtca 900
ayttcttcag ttgagttatc tgaaagtgtt gggcagtgac accatgccaa aactgttaa 960
attcatgcc a ttaaaaacag tggagtgttc tgcaaagccc gattctctgc agctttaaga 1020
ctggacagta ttgaaatatt cacaggaatc ttccaagccg tgaaagctta atattaaaca 1080
gcccttttaa ttgcaaagga gaaaaaatg gagacacttg tgaaaccttg cattctgagt 1140
gctgccacaa ataaattaag gaattccaga atttcttcat ctacttctgc a 1191

```

<210> 176

<211> 1499

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1462)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1476)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1495)

<223> n equals a,t,g, or c

<400> 176

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gccttctccc gcctccctcg gccttagcca tggcgagtag cggcggtgct gggcgggcgg 60

```

104

```

cggcgggccgc ggcgggcgaat ctgaatgcgg tgcggggagac catggamggc tgctgaaaat 120
atgacaagct gactttcttg agaaattctg atgagatatg tcaagctctg caagrgggtt 180
tgaagattgc attgtagttg agaattgtaca wtgaaattwc tgcattgcagc agtgtagaaa 240
aattttmcctt tttaaaagaa ttataaaacc atagctttat aaatcagtgg aaagtggctt 300
acagagagaa ctatcagatg tgtttacatc acatcttatt cacttttttt aacagctcta 360
atgcttttggc attgctatgk tcatatttat gtattcctta tttatagctc tgatagcttt 420
aattttctaa gcagtctgtc tatcagatgt gcacatctgc tgtgccaggt tgaagtatag 480
tggaacccat cagtagtaat gtgtagtagt tatgacttgt tgacatttcc attataaact 540
ttaattttga attgtttatg cattataact gtggatttat attgtattgg gctgaagttg 600
acaggatttc agccaccact tgtgaatttt tatttagatt cattatgtat atcagaatct 660
tgttttttga aataagagca tggaaaacat ttcttgtaat ctactcttga acaaagaata 720
tttagttttt caaacagttt gttgggcagc taatagtgtg aaccagggtca tttttgtatt 780
gagtaaaaaa atcaaacttt gagaaacttg gattttaaaa gtaatgacaa tgcttaggtt 840
agtatttttt gtaatttgaa tcattttacat ctaatgagaa tgttagttga gaatgttttc 900
ttaaagtttt atatcctata aataacggaa taaaaaaatt tgtaaaatga aacaacaaac 960
atgcaaaaatt cctattttact tttattacat aaaagtaatt ttagtgctta cctaataaat 1020
cttgaatggg tatttaataa attattagat ggggtgatgtg tttcaaaaga tacttgctat 1080
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tgatgtgttt caaaggatac ttgctatttt ttgaagaaat aaggattcca gtcattaaac 1200
aaaactaaac aatcaaatgt tctatattag gaatctcaag tatggctttt tttaaaaaac 1260
cttttttaaca tcttgatgtc aaggattata agtatggctt ttcagaattg ttttgtttgt 1320
cattattctt gccctttaaaa ttttaactca tcaaagtga gattagaaat aaatttttagg 1380
aaaatgtagg aatagtattg attctgtccc tgtaatagga atctcagtgg gggttttttg 1440
caaaactaat atgggtttcc anctgatttt aagtanttcc ttgaaatttt tgggnnttta 1499

```

<210> 177

<211> 1538

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (50)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (727)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1218)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1487)

<223> n equals a,t,g, or c

<400> 177

105

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tgtaccggga cctgcagccc gtgggctcgg ggcctacgg cgcggtgtgn tcgtccgtgg 60
acggcgccacc gscgctaagg tggccatcaa gaakctgtat cgkcccttcc agtccgagct 120
gttcgccaag cgcgcctacc gcgagctgcg cctgctcaag cacatgcgcc acgagaacgt 180
gatcggkctg ctggacgtat tctctcctga tgagaccctg gatgacttca cggactttta 240
cctggtgatg ccgttcatgg gcaccgacct gggcaagctc atgaaacatg rgaagctagg 300
cgaggaccgg atccagttcc tcgtgtacca gatgstgaag ggggtgaggt atatccacgc 360
tgccggcatc atccacagag acctgaagcc cggyaacctg gctgtgaacg aagactgtga 420
gctgaagatc ctggacttcc gcctggccag gcaggcagac agtgagatga ctgggtacgt 480
ggtgaccggg tggtagcggg ctcccagggt catcttgaat tggatgcgct acacgcagac 540
ggtggacatc tggtcctggt gctgcatcat ggaggagatg atcacaggca agacgctgtt 600
caagggcgac gaccacctgg accagctgaa ggagatcatg aagggtgacgg ggacgcctcc 660
ggctgagttt gtgcagcggc tgcagagcga tgaggccaag aactacatga agggcctccc 720
cgaattngka gaagaaggat tttgcctcta tctgaccaa tgcaagccct ctggctgtga 780
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aagaggtgct cagcttcaag cctccccggc agctggggggc caggggtctcc aaggagacgc 1020
ctctgtgaag atctctgggc tccgggggtgg cagtgaggac caccttcacc ttccacctga 1080
gaggggactc tcgttgccac cttgaccttg gctggggctt gcattccaaag gcatccatca 1140
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cccatcatgg aggagcanct gaactttctg gacaagacct ctggccgacc tggggatggc 1260
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gggctccaga tcagccttgg cctctgagcc ctgcctgctc tggggccatgc agaggaagga 1380
cagaggggtg gcgcagggca ccaactcagg gacatccctc ctctggggcg acgtcagtg 1440
accttcctgc acccccagcc tggaatgtaa atcagctgtg tgggtgcncgc gtggctggaa 1500
ggaaatagac cctttttagt ctccctgaaa aaaaaaaa 1538
```

<210> 178

<211> 896

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (194)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (825)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (828)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (831)

<223> n equals a,t,g, or c

106

<400> 178

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ggacgcgtgg gctgcacctc accttgtcca cgtaccagcg caatacctgg ggtgacttct 60
tagaggccat actgcctctg gcagtgcagg ctgcaatgga agaaaatgtg gagtttcgga 120
gggggtctgcc ccgagacttc atggattaca tgggggcccc gcattcagat tctaaggatc 180
cgggaaaaaaa ccgntttcat ggagaagggtg cgggtcttgg ttgcccgctt gggacacttt 240
gctcctgttg atgctgtggc cgaccagcga gccaaagact tcattcacga ttctctgccc 300
cctgttttga ctgataggga gagggcacta agtgtttacg ggcttycaat tcgctgggag 360
gctggagAAC ctgtAACgt gggggccag ttgacaacag aaacagaagt ccatatgctt 420
caggatggga tagctcggct ggtgggtgag gggggccatt tgtttctcta ttacacagt 480
gaaaactccc gtgtgtatca tctggaagaa cccaagtgtc tggaaatata ccccagcaa 540
gctgatgcca tggaaactgtt gcttggttct tatccagagt ttgtgagagt gggggacctg 600
ccctgtgaca gtgtggagga ccagctgtcc ttggcaacca cgttgtatga taaggggctg 660
ctgctcacta agatgcctct agccctaaat tagtttcttg ttgattgctg gaaacaaggc 720
agtagtgatt ctccgctgcc actgctaact tttttttttt ttttttttct cttaaactca 780
agttcttacc ttgataagca tcagtgtgct cacatttacc tttancantg ntcagtgtca 840
caaacctcgg aaggctctcta ggaagaacca tctcatctag gtacaaaagg gaaagg 896

```

<210> 179

<211> 568

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (67)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (469)

<223> n equals a,t,g, or c

<400> 179

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ttatcttaga tttctagtta tttatatatt aactttttgt ttattcagaa tcatttttct 60
gtttgtngga atattttctaa gagccttggg aaaatctcga gtaaaatttt aaatgaaatt 120
tgtatagtgt tctgcctctt tccaaaggta tttctcaaaa ttgggaattg ttttattatt 180
gaagtgtgaat gacttcaggg gaactctaaa atgcaagatg ggaagcttct gtttggtttt 240
ttcctttccc tttggtaagg tcttttgctt cccatccccct tgaccacact ttgtgctgtc 300
tgttgctccag tctgctctcc kgatccctaa rgakgtttct tatctaggct gccatttatg 360
tgggtaaaag acaaggtaga aaatactctt ctgtatcttg tatcaagggt taatctaattg 420
tcttcacac tttgttttga ratatttttg aatgttatcm acaattatna tagatggagc 480
atgtatgtct taggtttggg gttaatgttt aacatgcatt atcttattca atcctcacag 540
cagtcataaa atgtaggtgt tttagagg 568

```

<210> 180

<211> 428

<212> DNA

<213> Homo sapiens

<220>

107

<221> misc feature
 <222> (405)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (413)
 <223> n equals a,t,g, or c

<400> 180
 aaacacctat ggaaataatt ttgttttttt ttttttaaaa aggaatgaga tcatgtcctt 60
 tgcagggaca tggatgaagc tggaaccatt atcctcagca aactaacaga ggagcaggaa 120
 accaaacacc acatgttctc acttgtaagc ggaactgaac aatgagaaca cacggacaca 180
 gggatgagat caacacacac tggggcctga tgcaggggcc gtagcgggga gagcatcagg 240
 ataactagct aatgcatgtg gggcttaata cctaggtgat aggttgatag gtgcagcaaa 300
 ccaccatggg acacgtttac ctatgtaaca aaccgcacat cctgcacttg tatccagaac 360
 ttwaaatatt ttaaaaayct ttagagawtm caaaaaaaaaa ggttnttcaa tgnntcccca 420
 ttaaattg 428

<210> 181
 <211> 2901
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (10)
 <223> n equals a,t,g, or c

<400> 181
 agagaaagcn ttccattgaa aggtagatac tttgaggagt aaaaagactt ctttgaatgc 60
 tggtaaacac cgcatttatt ttgtgtatgc agtttgattt gcacatgtat aaatggagat 120
 gctttttcatt tttgtttgga ctgggtttgt gtcactgctc attacagttt gcttttttgt 180
 gtgtttgctg tgcgtttgga gatattagtc agtttcttta gtgatatttg tttccttgat 240
 gtgccttttc gtttttcttt ggggtttttg gaatctggat gctgttgaag ggcaatagca 300
 gactcctcca gctaagagac aggacatgtt cttgagccac tgtagctgtt gaagctggac 360
 accagacgct ccctataacc cccccgccag gccatagcgt gwatgcawgt gcacttccac 420
 ccacagagga ggggtgtgaag ctttgagaac ctcaagaaag ggctggattc tgccatacct 480
 ttgggtctac cttgggactg ctgggttgcca acgtgtcaac cagcctgtgt tccttgccac 540
 ccacgcactt gctgagggtg ggctgargca gaatcatgtg aatgggtgca tccaaggagt 600
 tcagggccct gcttgagaga gaaatamttt agcatcatga aagggaaaga acgtgcaccc 660
 cttttttgtt tcttttagtga atgcaagatt taataaaaagt gaataatgag cttccccctt 720
 gggagtggag cccagtgcag ctactgaca gggttgacat cagtatgatg tgttggactg 780
 aaactgtatg tctgtaggta ggtgtgtgcc ttttagggca gaccacggtg gccaccccat 840
 ttctccaagg tggtttacct agcttgtgta tattagacat tgccaccctc acctctggcc 900
 aaaaattctt gatttaaaaa gaaaagtcta ttttgtaaac gacaggctct gttgtatgtg 960
 ttactatccc aagcctggat tattttatatt atttaaaagt attttaattt ccatattggc 1020
 tttattctaa tcccatccat ccctgtggag ctgcagagca tcttcatgtg agtagacgga 1080
 tggacataaa tagattcatg ctcathtagg aagctgggag tttcgtgaag ctgagggtga 1140
 gttcctgtga ttctgttcg cttcaacaaa aagtgaggaga ccaagttttt atagcaaaag 1200
 accaaattag ctgtagagtc ttgaatgcag aaaaaaatta ccctagcttt cttagcactt 1260

108

```

agggttttgt gaggattcag tgttttagcac agtgcttggc catagtaagc cctagtaaat 1320
gttaaatatt gttatttagtg tttcgtaaaa cttgagaaat agagctgagc tcattccctt 1380
cctgttgatt caaaaataat acctacatga aaacatgatt ccaagttgat tgaatgttgt 1440
aggaattact ggtttagagt agcccagttc tcggcctacc ctgctgggtg ggatcttact 1500
gtattcttga atgcactggt ttgaaaatat gccagacttc agccccaag gaaacaaggc 1560
tgcaagaatt tatgaactcc agctggaaaa ggtaaagggtg acctttggct agccacatac 1620
tggaccttac cccactgacg tctttcagaa cattccaagg gttttcctca aggaacattt 1680
ttgagctaga aattaaaatg ggttctctgg cagactgcac cccttgagtc aaagttaaca 1740
gtattccttt gaatgcaata atagaggctt ttctgcgtta agggagaagg aatgaccaat 1800
tgaacttaca cattccccag gcaggctcct ttgccggccc ctacaggctg ggggtggcccc 1860
tcctgtcctc agggatcaga ctcccagact ggtagttct gcattgttcc atcaaattaa 1920
aggttattcc ctggccgcct cctggagaaa accaacccca ccctgccagc tgggggcaat 1980
ggggcaggga ttttggcctc tcagaacagc tcctagaggc tgctcatgac tgaatgtttt 2040
cccaaatcac ctaaatatcg gtttgctttt tgttttgggg gagaggattt agcctcttac 2100
ttccctgatg gattcaaagt tttatctatc tccttatctc ctgccctgtc ttggcacaaac 2160
tctggataga ttgcagggtg ggaatttgct ggagtttggt gacttcgtca aattcctttg 2220
gattctgttc cgccaaatca gcagtctcgt cctgtggatg cagtgactgg aatttcccat 2280
ctgcaaagca tctctgtagc ccagattttg tggagcctta agacactccc tcaatgccac 2340
cctgacccca cggctggaga accctgtgct tatgtggtgg gcagggccac tgttgatgga 2400
ggatggcggg gacgggggtg tgctcaaagg atctgtggtg ctggagggtc acacgcctct 2460
caggacagcg tgtcaggaac ctccagagcag cttcacatct gccaaagctg agagggagcg 2520
aacttgggaa gcattttgct cattgtccta ccaaagtatt aatagcataa tagttgatgc 2580
caaaggagat ggtgacgtcc cttccactgt agttgctgtc acaaccttga cgtctttaag 2640
ctaattggcg tttgcatctg tgtcttcaaa cagatcctgg ttacagccat tttgtgtgat 2700
tcacttcggg ggtaaagtaa tgcaggattc tgcaaacaag gtgtcgccgt ccaaatgtac 2760
tgtcctggca tagagagcac tgctttgttt tccactgttg tagagaaaac tagggagAAC 2820
tttatttttc aataaaacttt tcttgtgtga aaaaaaaaaa aaaaaaactc gagggggtgc 2880
ccgtacccaa ttcgccctat c 2901

```

<210> 182

<211> 290

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (276)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (286)

<223> n equals a,t,g, or c

<400> 182

```

taatttaggt gacactatag aaggtagccc tgcaggtagc ggtccggaat tcccgggtcg 60
accacgcgt ccgataaaac atgattttgt tttctaccct tcaaggtaaa cattaaaaat 120
aargtggtac ttgtgtwctt gtwcataaaa ccaaaattat akttgggaaa aaaataaatt 180
tatatatgaa aatgtcaaaa tcatttttaa agtattattt tcaaataaaa tggagaagct 240
ggtgaaaaarw maaaaaaaaa aaaaaaaaaa aaggngngccc cttttngggg 290

```

109

<210> 183
 <211> 641
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (14)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (43)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (55)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (68)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (80)
 <223> n equals a,t,g, or c

<400> 183
 gttcaggaaa cccncaaggg ggggggagtc caaacgggat gcnaggggaa gcttnccttt 60
 tcccagcnaa tttgtgttcn ggtttgaaaa gacccaccac aaagctttty ctattttctg 120
 atttaaaagt cgcttttgaa tatgaccatg agaaaccaag aaatgctgct tgtgtgggtgc 180
 tctgcttcct gaggatttgg ctggaagggg attctcgcgt ggcacatggg agaaggccat 240
 cttctgtgtc ggtgctgtga tctgccttgt tctcacttgc tgaggataag ggcatacacg 300
 ctgctcctcg ctttcttgtt gcccgacttc gtactaagca gctcaggagc agtcactcag 360
 acccaaatgt cttgactgtg ttgtttttta tcaactgtgac ccttaaagta caggccaagt 420
 gttgtcaaac accttggtcta aaacagtgga ggggtgatggg taaagcagta gagggccctc 480
 aacccacaca ctggctgaaa ctgccaccaa ctgccacgat gaacccaact gctgtttatg 540
 ccccatattt cctttttttg tatctacacc cacacgattc ccaatgttgg atattttctac 600
 atgaataaag caaggatcag tgcctcttat gtaaaaaaaaa a 641

<210> 184
 <211> 522
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (514)

110

<223> n equals a,t,g, or c

<400> 184

```
caccacgtgg ctgtgaaaat gacaaagcat ggtcgtgagc cactatgccc ggccgggattt 60
gcccttatta atggttattt cttgtgaaag tttctttttg cctttgcatt ctttttattc 120
tgtttatttc cccatgcctc acccaaagag ttgcacgggc aattggcccg tgaaggggac 180
gcctactttc aaacaaggca gacaggacac gacaggacgg cggtcatag cacagacttt 240
ggattgcagt ggatgggacc agatcctggc tccacttcts gcyagctgtg tggccctggg 300
caagctgctt aacctctctg gccctcagtt tctccccctg taaactgggg gatgtgaaca 360
gcgccctgcct ccgagtccta aggattggga gtagtcgtgt aaagtgctca ggtccacagg 420
ccatcaatac taatagttaa aaattattct tagaatcttg cttccctcag ctccctgaaa 480
ggccactaag gcaccccagt tgcagaggcc aatnggtccg gg 522
```

<210> 185

<211> 735

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (197)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (293)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (386)

<223> n equals a,t,g, or c

<400> 185

```
agtataacca tttaggtgcc agatttgata atcaccagck gctcatksar gtcctatggt 60
gcaaagttac tcttacsctt tttttacatt rcttgataaa ggcaatsttt aattayrtat 120
ttyctrttaa ctagctggta gagttcatac ctaaagtcag taaataatgt taagaatttt 180
ttccagctga gcaaatngta tgtatctagt tgtaagaaat caagaagagg atataaaaata 240
taatcaggat gtggactcta aaacggaata acctctatgt cctgtaactt ttntcactyg 300
taataataca gcattctcac cctrttaaat ggaaatttar agcaccytta aattccggaa 360
taaaattgct atttggatwg aaaaanccct taggcaacat ttattgaata ttagggaaata 420
acttttatgg gattagaatc cattttttat agaaacccaaa tttaaaagta tacatatttt 480
aatataagtg ttgtgataat acagtaacca aaattgaaca cacagtttta wagcttttta 540
tatttagtag cagttgaata tatatggcat gttttacata gattaatttt actatttttc 600
tttrtttaaa maagagracc aaattgaaag ccracagata ctgcaratga ctggggatttt 660
tgtttctgyc ttatcttttt gtgttttttt tctgaataaa atattcagag gaaatgcttt 720
tacagaaaaa aaaaa 735
```

<210> 186

<211> 785

<212> DNA

111

<213> Homo sapiens

<400> 186

```

aattcggcac gagagcaagc ggaaccaggt atcgtacgtg cggccagccg agccggcggt 60
tctggccccgc ttcaaggaac ggggtcggcta cagggaggga cccaccgtag agactaagag 120
aattcagcct cagccccag atgaagatgg ggatcacagt gacaaagaag atgaacagcc 180
tcaagtgggtg gttttaaaaa agggagacct gtcagttgaa gaagtcatga aaattaaagc 240
agaaataaag gctgccaaag cagatgaaga accaactcca gccgatggaa gaatcatata 300
tcgaaaacca gtcaagcatc cctcagatga aaaatattca ggtttaacag caagctcaaa 360
aaagaagaag ccaaataga atgaagtaaa tcaggactcg gtcaaaaaga actcacaaaa 420
acaaattaaa aatagtagcc tcctttcttt tgacaacgaa gatgaaaatg agtaagtgt 480
aatattttga atttagtcta ctttgaaagt atatggagtg ttcattaaaa tcacattttt 540
tcctattata aagatactac aagttcttta tagaaagttt aggaaataga gaaaaaaatt 600
taataaacta catctattca tcaatacccc tctgacttaa aatgccaaact ctatagaaat 660
tagctagtat taacattttg ttatttccct tgtgtggttg tatatatatg taaattatat 720
ttttaagcaa aatacatttt ttgtgtgtaa acaaaatttt ataaatacaa ctgtattgca 780
aaaaa 785

```

<210> 187

<211> 1679

<212> DNA

<213> Homo sapiens

<400> 187

```

gatcttttagg tttttcctat agaaaacatt cttcctccat cagtagccct ttatttgata 60
ttcagaagtgt gaaagctttt tcattctcca gtagaacttt taaaaattgt tacagataacc 120
tagctcttca cagatatcat gtattgtaaa cagtcagtgt tcttaatttt attttctcta 180
tttgagtgtca taattatcct aataatcccc aagacactga caactcaagg aacagcagta 240
cagtactatt agaagttaag tatgttgttg ttatttcaca tttcatttaa ttgtggataa 300
atgttagaca tctgttgaaa taagctcata tgggtggaaac gacaactata ttatgaatta 360
ttttcagaaa tggatctttg aatagcagat caggatttaa ataataaaat tatctatgaa 420
tcacttttat ggtcatacat atatgatata aatccagagt tattggtgca gaaatggcta 480
cccgagagct tggtaaatTT gccttggttt cttatgttaa atgtattgtg cttcccttct 540
gtctctagaa tgtggctctt cagaagacag acaatcgaca tttaaatttt tccaaacaat 600
gaaaaactaa attaaaaaca ttgcttgata tttcatttaa aattgcacct tgcttaagggt 660
ttactgaata actgaaatgt cagcaattta aaataaattc aattgtgtga taaaatatct 720
cacctataat agaagaaaag gaaaatcata ttatttggca attttgcagc attgtggttg 780
cctaacaggt atatccagca gatgagaaac agtatgaaag gattgtatta acatggtaag 840
ttttgcccta aggaaaacga tcttgcattc tggattcttg cagcaaagtc tcagatactt 900
aatacgtttt cttgktttat catctgktct atgattcggc ttcactttgt gtggktattg 960
aattatgtaa cagagatttg gktttcccaa aatgktatca catTTgaaac tatgattgct 1020
ttgkgktcag tccttttgga acacgtagct tycagcttaa gggtagagga aatatataacc 1080
taaaatcatc aatacatgaa agaaaaagga tggaaactat gtcctcagtt ttacttctac 1140
caaaacatcc ctgtatgtgt gtgcatgtat gttggcgtgt gtgtgtgtgc atgcatatta 1200
gtaaatgtgt gtttgcattg gtgtgttggg gagtgatgt gatctgggtg tttgtttatc 1260
tctgttatta tcccccttta gctttatttt agtcaactct acattatgat gaatttcaaa 1320
atgaagctgt attaaaataa ttgtaataata acaattcaat ctacatggt actgcagata 1380
gttaactttt gctgcaatct attgtacatt tgcaattttc tgtgttagta aacttagcag 1440
aatctggtta wttattttwg tgtaggctta atgttcaactg aaagataagt caattactgy 1500
tagtaaaaaa ttaagggtact ctactgcag agatttaagc ctgggcctaa tgtgctgtat 1560
tatgaagcct tgtgactgaa aaatatgttt acatatgttg tctatttttt taataaactt 1620

```

112

ttatagctgg tctatttgct cagtaaaaaa aaaaaaaaaa aaaaaaaaaa aaactcgag 1679

<210> 188

<211> 780

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (289)

<223> n equals a,t,g, or c

<400> 188

```

cgggtgggctc gcgttgaggc tgcggtcatg gagggagcag gagctggatc cggcttccgg 60
aaggagctgg tgagcaggct gctgcacctg cacttcaagg atgacaagac caaagtgagc 120
ggggacgcgc tgcagctcat ggtggagttg ctgaaggctc tcgttggtga agcagcagtc 180
cgcggcgtgc ggcaggccca ggcagaagac gcgctccgtg tggacgtgga ccagctggag 240
aaggtgcttc gcagctgctc tggacttcta gggatctcag ccgtggckna ggccaccccc 300
agaggagccc ctggtccaca gaagcaggcc ttgtgtttcc agcggcctct gataagaggc 360
aggaaggam ctgaaggatt tggarttgat tcaaacaaga tctctgggag tctccagcct 420
gtgcagaagg ggcaggactg cagtgcactg cgggccttgg agtgtccagt ggggacactg 480
gtgtgggaag gggcagcacc tggggagtcc ctgcctctcc tccctgggac aatagtgtgc 540
atgccacccg gggtcctaca ggcagggtgct gggaaaggcc tggccagcag gtagcctgtg 600
tgtttgacaa acagcagctg gcagcgtgc ctccctgccc cattcctgcc acccgacatc 660
aaagctggcg tgtgaccttt ccagccatgc gatattcccc ttggaagatg cttccccagg 720
ctataaattt gttctcacia agcaacatca ataaatcaaa actgtctcty ccaaaaaaaaa 780

```

<210> 189

<211> 533

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (485)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (498)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (522)

<223> n equals a,t,g, or c

<400> 189

```

ggtcccttta aggtttgctt ctacagcccc tggacttttag cctaaacacg gacccgcgaa 60
gctggcttta tttgtccatg tctcggacag agcctgggaa gctgccagtg agatttcaga 120
gaccaagagc gcgaaggggc gggcgatgtg gcaatccgtc tgggatgtga aaagcgtgga 180

```


113

```

gcgcatttag aggcattcga cgaaaacaca ggaaatcact cctctcccgc tccctgggcgc 240
cgctgccact ggggcagagg actgggaacc gcggcagcgg gataagtggc ccagccagag 300
agcgcagctc ccgcgcccgg tcctgccctg cgaaccacgc ggccccctgg gctgaagctg 360
ctccggccat ggccctcggc cccgcgcccg cccargggty gctgtcccct gcttgctggg 420
ctcctcccctg gtacattgcc tcctcccgga cacaaattac tccctgaaaa aaaggccctt 480
tgttnaacct actgtggnta accgcctttc aaaaactaaa anttgctggg gaa 533

```

<210> 190

<211> 602

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (548)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (583)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (590)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (600)

<223> n equals a,t,g, or c

<400> 190

```

tccttaatct tggttttcct taaactttct ataagtccag catctgaaat attttgtcaa 60
ttatcacatt aatgtgttca ttttgtaagt aagagtactc aatttaaaat gatcttactt 120
taaaagtggc ctagtttgca gtgcccagca ggacactgac agtcacagct gtgtgacttt 180
ttgtgggtta cttaattttt ttgagcctcc ttttctcttc tattcaatga ggataatagg 240
gcctacctca taggattatw atgcattccc ctctgttaat gcacgtaaag tttttacttg 300
gaaaactaac tcaccattta acaaccattc taagcaccat agaatatatt ttgtttcaca 360
aatttggtat tcattcagaa taagtatttg aaaagtgagt aaattctatg caattatagt 420
tattaaatga cttataaaact gtgtttctct tccacttctt gctacattta atcttctagg 480
tgttcagata tcttttgaga ttataggcag caataaagct aaggcagcta acctttaaca 540
ttcttgngt caagctaata ttttggtgaa aggggaattct tgnggttctn aaaaaacttn 600
ga 602

```

<210> 191

<211> 858

<212> DNA

<213> Homo sapiens

<220>

114

<221> misc feature
 <222> (772)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (801)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (814)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (815)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (852)
 <223> n equals a,t,g, or c

<400> 191
 cttggctcaa acaatatttt ccctataaca aaggcaatag gacacaaaat tcacatcctg 60
 ctgggccttt ttcatcaag tcagggtgat ataaaaacat tggaagtctt ttcaccaaac 120
 cctgacttta ttgaatgcta gtagaagatg tagaattaga gacatctgat ttgtttatca 180
 ccttagcaga aaaaccacag tccaaaagac aagcaaatta agaatggagc ttaaccatgc 240
 ctccattggg aagtctagac tttgagccag gtacagtaag aaaaattagc ctctgattca 300
 ttaagtttgc cacatgactt attttgatat tttggataca ttaactcact taggagaatt 360
 cagaaaagaa tgggtgatta aagttcatta cagctgaata aatgtgtcta aaacagactc 420
 ttgtattctg aaagtacagt ctacaactga taaaacctta tgattctttt ctccccatt 480
 atgcccctat atatatcaag atttgggtac tttatttttag tagaaaatat atatctttta 540
 catatgtatg tatttataaa tgcatagata tatgtataaa aatttgtaag cgtttagcggc 600
 attaattcac caatgcattt ggacaacttg atgtaactga ctttatttta tgtgactata 660
 ataaaaagca taattttctc aaaaaaaaaa aaaaaaaaaa aaaaaagggc ggccgctcta 720
 gaggatccaa gcttacgtac gcgtgcatgc gacgtcatag ctcttctata gngtcaccta 780
 aattcaattc actggcccg tngttttacaa cgtnttgact gggaaaaccc tggcgttacc 840
 caacttaatc gncttgca 858

<210> 192
 <211> 667
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (82)
 <223> n equals a,t,g, or c

115

<220>

<221> misc feature

<222> (234)

<223> n equals a,t,g, or c

<400> 192

```
gcgggggaag cggggctgta gctgggcagg gagagggcgg acgaaatcgg tagcgatctc 60
ggctgcggcg ctgcccactt gncccgcccc gcggggcgcg ccctgaccct tcattcttgg 120
gcaggctcga gggcgcgcg cagggttggcg ttctggggcc tcaaactcct gggccttgac 180
cgggcaggcc gcgtctcccc ggggtgtgagt ccaccgggac cgggcgccc cctnaagcgc 240
gkgcgccaca gaagcggcgg cgccgaaga cgcgctcctg gctcggcccc acagcctcgc 300
ttggcgccca gttctttctgc agccgaaggc ggttggttctt ttaaagaatt attgaagacg 360
aagggtttttt tctttttatt tttttaatgg ytttacagaa tcttaaataa aatacagttt 420
gacatgacgg caaaaaatgt tggtttgact tccacaaatg cagaagtaag aggatttata 480
gatcagaatc tcagtcacaac aaaaggcaac atttcatttg ttgcatttcc agtttccaat 540
accaactcac ctacaaagat tttaacaaaa accttaggac caataaatgt gaatgttgga 600
cccaaatgt gatagaaaac gggctagaaa atttatagac tctgattttt cagaaagtaa 660
acgaagc                                         667
```

<210> 193

<211> 537

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (85)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (511)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (537)

<223> n equals a,t,g, or c

<400> 193

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gttacgcctc tataccggca gcagccgcgg agagcatgcc ccgcccccggt ggagcccacc 60
ccgggcgggt aacctcgggt ctcantcccg ggctgtgacc ctccccgagg ccccgcccc 120
acggcggaagg cccggggcag ttaacccttc tcttgctgcg gcagagtccg caccggggca 180
ggcccatctc agaattaacg ctttgatggc atcaccgcgt cgggaatccc tggggatggg 240
gttctccacc gtcaagacct ttgagccgcc tgagcgacta actcctgcgc ccctgagggg 300
acattttatt cagaaattaa atcattcaga gttccagcac tgtcgggggt catcgggctc 360
tgtccaccgc catagcctag cattgtcacc aacggagcca trgagggacc tcggcccaag 420
ctggggcctc ttcatgtgcg aaaaggcctc ttgccagacc aggatctgtg ggcgcgggca 480
ggctggagga ctagggcggt ggcagtggca ngtgagtga catggctgtg ggtggtn 537
```

<210> 194

116

<211> 400
 <212> DNA
 <213> Homo sapiens

<400> 194
 tctaactata ttaaaaaatt tctgtatggg gatatcatta ggaaggggtat cagtaccttg 60
 tctgtwatgt gtctactaag caaaacccaa actgcagcac cccctgtggg tacactgcac 120
 ctccagtttg tactgggggt tgttggccag gctataggca tctttcacag gtccttgctt 180
 agcatcccaa gtactgtgaa tacatgttga ttctttaaaa agacctggat tccaactcaa 240
 ataaatcaca tcataatact ggcagagatc atcccaggaa atccaaaata ttccgttgct 300
 tatttttctga gctgttcggg gatcaaagtt taaatacttt tgcaactctg gagtccagtt 360
 ttttacatca ttttactgt atcttccttt ccaacgtaac 400

<210> 195
 <211> 431
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (411)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (417)
 <223> n equals a,t,g, or c

<400> 195
 cgcggtgggcg gacgcgtggg gtgaattttc agccctcaga gcagaaaatg agaaaataaa 60
 actcgaacta catcagttaa aacaacaagt aatggatgaa gtgatcaaag tccgaacaga 120
 taccaaatta gacttcaacc tagaaaagag cagagtaaaa gaattgtatt cattgaacga 180
 aaagaagctg ctggaattga gaacagaaat agtggcattg catgcccagc aagatcgggc 240
 ccttaccag acagacagga agatcgaaac tgagggttgct ggcctcaaaa ccatgcttga 300
 gtcacacaag cttgataata ttaaataatt agcagggtct atwtttacst gcytaacagt 360
 agctctggga ttttatcgcc tgtggatcta ataaagtgtc tatTTaaagg ngaaaaanaaa 420
 aaaaaaaaaag g 431

<210> 196
 <211> 417
 <212> DNA
 <213> Homo sapiens

<400> 196
 tttcactttc tacttttttc attttgttct gttogaattt tttataagta tgtattactt 60
 ttgtaatcag aattttttaga aagtattttg ctgattttaa ggcttaggca tgttcaaacy 120
 cctgcaaaac tacttatcac tcagcttttag tttttcta at ccaagaaggc agggcagtta 180
 accttttttg tgccaatgtg aaatgtaaat gattttatgt ttttcctgct ttgtggatga 240
 araatatctc tgagtggtag ttttttgaca ggtagaccat gtcttatctt gtttcaaaat 300
 aagtattttc gattttgtaa aatgaaatat aaaatatgtc tcagatcttc caattaatta 360
 gtaaggattc atccttaatc cttgctagtt taagcctgcc taagtcactt actaaaa 417

117

<210> 197
 <211> 734
 <212> DNA
 <213> Homo sapiens

<400> 197
 agacatattg aggtgcctgc ccttgtggag tattcatttt atgctgcccc agatatcatt 60
 taatttagac ttaacaagta tttccttgtg attatattac tctgtccttg ttaataaaagt 120
 gctgctgtgt ttgactctga acatactacc aaaacttctt caaagagttt tttatgaaag 180
 acttttcctcc tttacaagar agaaatrugg tgctgccttt ctgttttagta aaagcagaat 240
 ttgcagtggc atctaaagag acttttttaa ataaaaatta tgtattgtgg cataatcctt 300
 tttttgagct ctacagagaa cagtcttttg gtaatagtgg caggatatta ttccttctga 360
 atatataccc cattatagga ataactgtta cttatttagg attccatcat tgaaaaatttt 420
 gacccaaggc acagcagtga aattttatagt tcycaattta gttgtcatta ttgacaggca 480
 ttggtattat tagtcattgc taagcaacta aaacttcac agttcaaata agttttaatt 540
 gtcaaataaa gtataaacac atgaactttc tagaaatatt tctctttttg gatagggtctt 600
 taaccagttc atatataac tttgtcaaat atatggatgt gtatgtgtac atttataaga 660
 accagtatgg atacatccat tcaactgtgg acatttttaa ataaaatatt ttagcagtga 720
 atatggaaaa aaaa 734

<210> 198
 <211> 606
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (144)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (155)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (598)
 <223> n equals a,t,g, or c

<400> 198
 aggaagctgg gggaccattt tgcacatga gtttgtgaaa aatctggatt aaaaaattac 60
 tcttccagtg ttttctcatg cmaaatttyc tyctarcatg tgataatgag taaactaaaa 120
 ctatttlycag cttttcctca attnacattt tggtngtata cttcagagtg atgttatcta 180
 agtttaagta gtttaagtat gttaaagtgt gatctttttac accacatcac agtgaacaca 240
 ctggggagat gtgctttttt ggaaaactca aagggtgctag ctccctgatt caaagaaata 300
 tttctcatgt ttgttcattc tagtttatat tttcatttaa aatcctttag gttaagttaa 360
 agcttttttaa aagtttagtta aaagaattga gacacaatac taatactgta ggaattgggtg 420
 aggccttgac ttaaaacttt ctttgtactg tgatttcctt ttgggtgtat tttgctaagt 480
 gaaacttggt aaattttttg ttaactaaat ttttttctta aaataaagac tttttcacia 540

118

wraaaaaaaaaa aaaaaaaaaa actcgagggg gggcccgtac ccaatcgctt gtgatgtntc 600
gtatac 606

<210> 199
<211> 373
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (251)
<223> n equals a,t,g, or c

<400> 199
catcttggag gtcaaataat agtaggaaaa gttcagcaga tactgaattt tctgatgagt 60
gtactactgc agaaagagta ctgatgaaat ctccatctcc agcattacac ccacctcaga 120
agtacaaaaga tagaggaatt ttacatccta aacgagggtac tgaggaccga tcagatcagt 180
cttctctgaa atctacagac agcagtagtt acccaagtcc ttgtgctagt ctttctcctc 240
catcctcagg naaaggggctc aaaatctcct tcrccaagac caaacatgcc tgttcgatac 300
ttcataatga agagtagcaa ttgagaaaac cttgaaattt ctcaacagaa gggatatctgg 360
gtacaacty cta 373

<210> 200
<211> 3652
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (306)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1412)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1519)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2101)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2102)
<223> n equals a,t,g, or c

<400> 200

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acgagctgat gtctcccgga ggaatctgca attgcataat ttagttgggtt gcttgtctac 60
tgtctctctc tttggcaaga atgaaagctc tatgagcaaa cagaccttgt ctgccttatg 120
atccatttta ttactagagc ctaggactgt taaattcatt aataaagtct ttccatcact 180
ttttgttctt tatattcctt tactcaattg atattcagca tgtgcagaac agttcttttc 240
caaggctgca taaaagtfff ggaatgaggc acataaataa tacccttcta ccaataaatg 300
ctatcngtta taaaatagtt tttattttat aatcactgaa tatgtcaaaa ctttacagtt 360
caggcctttt gaatcaaatg caaaatcaaa tatgaaaagg ttaatgatct tgtccactaa 420
aattgtagtt tgccatacac gaaaatagac tcttaaaaaa gataaaaaaa aaaaaatcat 480
tcttaaggaa acatattaat aagacattta aaaaggctaa gatctttaat gtgaaaaata 540
ataagataaa gatgacaacc actgaagaga agaaaaaacg ttttatgttt tttctaaatg 600
tgtgtaaaaa caaaatcttg tacctaccaa aatgacactt ttttcaaaga aaggatatcaa 660
atgtgtatac tttaacacac agcccttctt tgtgtaaata tataggaaat ccttaaagga 720
gcataaaaca atttacttag aaattctata cttaaactta ttcaaaggaa ataattaaag 780
gtgtgtaaat aagatatgca tagcattgct ctaaagtgtc aatagtaggg aactaggtaa 840
ataagatata tctatttagg gaattagtca agtaagatat acctatttag ctaattccat 900
gtagccatca aaaggatacc atagaacaga acttattgat gtgaaaagat gattaaaatg 960
tacttgttac taaaaacagc aggctgcaat actgtattaa ataatgagcc catgctgtat 1020
atctagacaa acatatatca taatgataat aataaatgta tgagacttat atttttgctt 1080
ctctgtatfff tctaatttgt ctgtgataaa caaatattat taatgtaatg aagaataagc 1140
taaaatatac aaaaacaata acaactataa aaagaacccc ttcaatcaaa aagagatcat 1200
cagggatffa attcaactat ggattggcac tattaggagg ccaaatatga ttctgtgaac 1260
tgaactgtag taaagacaag atattaggaa aatgtttaaa ttatgtgaga actattctca 1320
agcactttta agatctatff gcaagataac aatgtgctaa ctttaagtaa tgtctatgta 1380
ttcttgagac cagctttgac aatgacagct gncattccat ttgacttgga cttacattat 1440
gtttttgtct tattttcaaa aacagaaccc agggactgat tcttacaagc attttcttaa 1500
agattcactg ggtggctgna aatctgatca agctgttctt tgggagatca ttattcaaca 1560
cttatcacat actttatttc tacagctatg actgtcactc cccaagcttc acttcataat 1620
gaaaataaaag aatacagccc ttttggaana gttggatggg aataccaagt gcgtaagttt 1680
ttagtacatg ccatatcaca accttctacg tggctgactt ttgacttttt catttctttt 1740
ataactgaca gaagacacaa aggcaaaaat gtcaacttca caaaaaatct tagtgctttt 1800
tggaaaagaat gttatagatc atccagtcta accccctgat gttataaata tggaaaattt 1860
ggcctagaaa ataggtaagt gatgaatcaa actagaagca ggtgtcctgc ctctaagccc 1920
aatccagttg ccatcatcat ttactattta catggaacat caggttctac tttagaagtt 1980
aactatcaac ctacagggtt aaggaaaata gcaatgtgta tatacagacc ttgcatctgg 2040
tagctgtatg gtgcctgtcc aggttgaggg gtactgaagc ttgtgccata gctgagaaat 2100
nntgtctgtc caggtgactg agactgtgac aatccacctt cagtcttgat gcctgcccac 2160
aatgcaccta aatcagttag tgatagctta tctatctgtc cattttcaaa agctggtaaa 2220
tatacaaaaa catacacttc cacaaccggt taactacaaa tgcttcccca atcttatctc 2280
aaaaataaaag ggtatacatg cattcagtga aataccataa agtacaactt cagtttttta 2340
aatccaggat tacagatttg aatgtctatt cacattatc tctcttgttt tattgcactt 2400
caagacatat ccttctata aaatgtaact ccagtgatat attttcatac ttaattttgt 2460
tgttttaatt atgtaagagt tgaagatcat ctccctcaca gtaaagaaat agccataatt 2520
aaattttagc taaatgttcc caaagttgct atattgacta gtgttaaaaa taaaatcctt 2580
ttttatatata aaaatattta ttagatccta taccatcaca gtatttttcc ctcccttact 2640
ctttctacta caaagctgat ttcagtacca actcattttg aagtccaaag aagcaatact 2700
gggcacagaa ctaaacaaca tgggtgaaag gcttttccctg aatatctagg tcctatcaga 2760
aaataagcac aaaggaagca gaacactaat gagctgaatc ttataaaaaca gcagtgattt 2820
ataaacaagt gaggttgacc agcagtttcc ttttgtccct gttagtgtga aatatttgac 2880
tataattggt ttcgatgtag tctaaagtac ctttgttttt atcatatgat aatataaaaa 2940

```

120

```

tgatgtatct gtggccccc aatacttccc caaacaccag gctaacatcg taattttggg 3000
acttggatctt ggcagcactg aggtatgggg ctcagctctg tctttaatta attacaatta 3060
aagacagtca tacatgttaa caactctcct tcattctcac agagggaggg aagaaaaatt 3120
tctgccgagg gaattcacat tttttaataa ttttgcttcg tacttaagat aaatgatatc 3180
tttaggatctt agaatacaca gtagtcttac tgtttatttc cattttaggg gaatctcatc 3240
agcagagtac agctaggtaa ttgttttaag gcagtgggag aatctgactc ttgggtgaga 3300
gtgcctactt taattcctgc agtatctcta aataacttca taatgacctt aacatttaag 3360
tcttaacaca accttaacat tttaaaaatg tgattttccc tgtaaagggtg atcccaaacc 3420
aatgaataac ccacacatag aaatgggtccc tggaaataca cctgccccag acagggtggca 3480
tgatggcttt agaaaatccc tttctttcca tgttgctcacc cctagggatt ttccacctct 3540
tgctgcattt gagactatac tgatctgctt ccagccttca cctataccaa taaaatacca 3600
ataattcatg tatttttttt ttttgagacg gagtctcgct ctgtcaccca gg 3652

```

```

<210> 201
<211> 551
<212> DNA
<213> Homo sapiens

```

```

<400> 201
gctgcagcga cgtcggggagc agaagcagcg gcgacacgac gcgcagcagc tgcagcagct 60
caagcacctg gagtcctttt acgaaaaacc tcctcctggg cttatcaagg aagatgagac 120
taagccagaa gattgcatac cagatgtacc aggcaatgaa cacgccaggg aatttytggc 180
tcatgcacca actaaaggac tttggatgcc actgggggaa gaagtcaaag ttatgcagtg 240
ttggcgttgc aaacctatgg tcaccgaacg ggtgacaaag aatgcccttt ctttatcaaa 300
ggcaacccaaa agttagagca gttcagagtg gcacatgaag atcccatgta tgacatcata 360
cgagacaata aacgacatga aaaggacgta aggatacagc agttaaaca gttactggag 420
gattctacct cagatgaaga taggagcagc tccagttcct ctgaaggtaa agagaamcac 480
aagcaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 540
aaaagggggg g 551

```

```

<210> 202
<211> 665
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (463)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (471)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (582)
<223> n equals a,t,g, or c

```

```

<220>

```


121

<221> misc feature

<222> (612)

<223> n equals a,t,g, or c

<400> 202

```

gcggcacagag aagtcacagg tcttgccaat actgttgtag tttcttgccct atatccgtaa 60
tttgaaggaa atggtragag tgattagaga agtgtaatta ctgtaatttt tccccctatt 120
gtagtttctt gcctgtatcc ataatttgaa ggaaatggta agagtgatta gtgaaatgta 180
attactgtaa ttttttcccc attcaacttt atatatcttt aactgatgac cagatcattg 240
ttgttctgaa ccagtttgtg gtcagcaagt gttttgtggg gttttgtttg tttgttttta 300
aagaacagtt tgggtcactt gacatggttc tccaaaggga tkttatgggt tgtwtttggt 360
tctgggtgat aaccgacttg ttagataatt tagataagca accgagttgc catgtttggt 420
tgtcaaactc caagtgtagc ttatatttta tgttcctaga gangttgtca nggaaagatt 480
tgaccttttg gcaaatctgt ttgaatagag atactaccat gctgccaat aaggctttct 540
ggccctgaaa aatatacgga attattcttg gaaatttgaa anggaaaaaa gaaataaact 600
gatccatgtt tnttaccatg ccaaattaat tgaaggaatt ttctataaag gtatctcccc 660
tcggt
665

```

<210> 203

<211> 2102

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1861)

<223> n equals a,t,g, or c

<400> 203

```

aaaaaaaaaa aaaaaagaaa aaaaccaaac taaccaaacc tctgtaaaag agtgctttga 60
gctctacaaa taccaagtat ttattgtggt atatttttag aatgtagcca tacagtgtaa 120
ttatgggtat ctgtcatgga tcacaattat tattcatagt aagtcattgt gatacagaag 180
tttgtttctt cacttccccct taagaagcca actatagtaa tcatgcaaag ttgaggagta 240
tgtccttcag ggatataaaa agaaaaacaa atctgttttt tgagctaaaa gagcacatcc 300
aaacaagaat ttaactggct aaaatttagt aattactgtt aagtaactat caaacttgaa 360
atcttacaaag ataaatgggt aagatgtctt gagtatttgg gatggggggc tgtgagtctg 420
attgagacat acattttaca gagtagcagc actggaaagg gctagtccaa cctcccagcc 480
tctgcttggg tctccgctgc cccagccaca cacatcctag aattcttgta aacatatctg 540
gctctgtggt aacagtgcac ttgttatatg ttttctaaga gattagtctt tctgtgatt 600
tttccaagta cgctgaaagt agtagtatga acttaaggag gctagtcaaa gaaacttgga 660
gttataggta tttttaaaga ataaatcctc aattccatca tcacttggcg gggagggggc 720
acttattaag catttttagat aataaaactg gttaagctta ctctggtaga acagacaatc 780
aaatctgggg attgctgaga acaataataa gctgaagtat ggctcacaga atcctaacac 840
aaatcattaa gtctctagtt agatttgtta tcctaaaatt tttcatagaa ttttaaaatc 900
taattctgac ttgtatggtt aagaaaagca gttaaataat ttactactta tcaagggtct 960
ttaaaaataa taaatctgat tgataggaag aaaggcaaat aaatacctat gtagacattc 1020
tataataaca aagagccata gatgataaag gaattagatt ttaatgtaga atgggtggtt 1080
tctgaaacaa aggtatgtgg tactttgtag ttattgatga gaagccagta accagtagtg 1140
ttttcctaga tatatgccca cctcacaca actttcttca ttaacaaaca ttaaataatgc 1200
atttgtatct tattaaatta tattgtataa tgctgaagga aaacaaaaag tgttcaaata 1260
atcataactt ctacattaca ggttctgttt agatgcagaa ctagaggggc cagggtaaat 1320

```

122

```

gtagataaag agatatatag caccatgctt cttaatgctt catacttttg caaacagaaa 1380
aaaaaagttt tactttttatt ataaaacttc atctatgggc aaagtaaaca ctgttacatt 1440
taaattgctt tttaaaaaca attgcatctt aaaaagtcaa aaatctgaaa ttttaataata 1500
tgagacttac actgaatata atgttcattt agaagttgct gtgggtccact tcattttataa 1560
ggaacaaata tttttacagt acactatagc aacagcaaaa gccctctctc accctgatag 1620
gaatgggttt gctgggtgct tagaagttag attcctgctg aatagaatta gccatcctta 1680
aaagatttta atccaatact gaactgttta taaaatgctt tctctattgt aatgtactgt 1740
aagtagtgaa attctgtata tactgctatt ttctgtctgt tcattgttgt gaacttcctta 1800
tgtatattag tgaaataaat ttccagcttt catgttggtt cctaaacatt cataagtata 1860
nctaactatt aagagatttc ttccctttct gagtaacaaa tttgggtgatt atattctttc 1920
tgatccaacc ccaaaaacta gctattctga aaaggctgat gttcactaat gggaagaatg 1980
aatgaccct tcacctctta agggaaaaca gcctccgcca ttccctttca aaactatact 2040
tcttttactt gatactcaaa acttctgcac caaatcagt cagtattttt ccagaatgcc 2100
tt 2102

```

```

<210> 204
<211> 283
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (181)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (282)
<223> n equals a,t,g, or c

```

```

<400> 204
aactgatatt taataatatt taatattgct ctaaaatttc tggctaaaat gaaaatattc 60
aaccatcagg aaggagaaac aaaactatta ctgtttgtaa acagtttatc atcagtactt 120
acctaaaaat cctggagaat gagctcagaa atattttctaa gagttgagac agtttagcaa 180
natgaacaga tacaacctca aaccaaacca aactagaaag ctcagaggac acagaatgcc 240
agtactgggc tgggcaacac ctctgttggt tgtgaaaatg tnc 283

```

```

<210> 205
<211> 425
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (34)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (77)
<223> n equals a,t,g, or c

```

123

<220>
 <221> misc feature
 <222> (424)
 <223> n equals a,t,g, or c

<400> 205
 ccacaccccc ataaggccat ccaaataat t aaangccccc ccagtgggaa atttggtgtt 60
 taaaacctca atggaancct aatatttccc ttatgtccgt tagtcccctg taaaatgtta 120
 ggtcacccca aggaaagggg agaaatagca atgggtgttc ctaagggtatt gcttgccctc 180
 catgtcttcc taaagagcag aacttggagt ttctccttta tgtagagaag aagtwactta 240
 ggggtgtat t gcaatgaaat attcatagat attgaaagct tgtgtttaca tkaaatatgt 300
 ttattatcaa gaagtccttt ttccaattct gtacattaaa tatatgtgtt ttaaaaaaaaa 360
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aagggggggg 420
 gggnc 425

<210> 206
 <211> 483
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (444)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (469)
 <223> n equals a,t,g, or c

<400> 206
 cccacgcgtg grcagaccgc gcagggagca cacaccgcca gtctgtgcgc tgagtcggag 60
 ccagagggcg cggggacacc gggccatgca cgcccccaac tgaagctgca tctcaaagcc 120
 gaagattcca gcagcccagg ggatttcaaa gagctcagac tcagaggaac atctgcggag 180
 agacccccga agccctctcc agggcagtc tcatccagac gctccgctag tgcagacagg 240
 agcgcgcagt ggccccggct cgccgcgcya tggagcggat ccccagcgcg caaccacccc 300
 ccgcctgcct gcccaaagca ccgggactgg agcacggaga cctaccaggg atgtaccctg 360
 cccacatgta ccaagtgtac aagtcaagac ggggaataaa gcggasgrrg gacagcaagg 420
 agacctacaa attgccgsam cgntcatcg agaaaagaga cktgacggnt taamgaktga 480
 tcg 483

<210> 207
 <211> 976
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (193)
 <223> n equals a,t,g, or c

124

<220>
 <221> misc feature
 <222> (929)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (958)
 <223> n equals a,t,g, or c

<400> 207
 agcttttcagc aagagatggg cacaatcaga aggataatac aaagtcaaaa gagaaggaga 60
 gtgaaaacgc ttccaggaga tggtaaagga aataagcata agaaacacag aaaaagaaga 120
 aaaggggagg aaagtgaggg ttttctgaac ccagagttat tagagacttc taggaaatca 180
 agagaacctc cangtggtga agaaaataaa acagactcat tgtttgttct cccaagtaga 240
 gatgatgccca cacctggttag agatgaacca atggatgcag aatcawtcac ttttaaatcm 300
 gtgtctgaaa aagacmagag agaaagggat aaacccaaaag caaagggtga taaaacccaaa 360
 cggaagaatg atggatctgc tgtgtccaaa aaagaaaata ttgtaaaacc tgctaaagga 420
 ccccaagaaa aagtagatgg agaacgtgag agatctccct cgatctgaac ctcccaatta 480
 aaaaagccca aagaggagac tccgaagact gacaatacta aatcatcatc ttcctctcag 540
 aaggatgaaa aaatcactgg aacccccaga aaagctcact ctaaatacagc aaaagaacac 600
 caagaaacaa aaccagtcaa agaggaaaaa gtgaagaagg actattccaa agatgtcaaa 660
 tcagaaaagc taacaactaa ggaagaaaag gccagaagc ctaatgagaa aaacaaacca 720
 cttgataata agggagaaaa aagaaaaaga aaaactgaag aaaaaggcgt agataaagat 780
 tttgagtcct cttcaatgaa aatctcgaaa ctagaagtga ctgaaatagt gaaacccatgc 840
 accaaaagcgc aaaatggaac ctgataactga aaaaatggwt aggacccctg aaaaggacaa 900
 atttctttta gtgcgccacc aaaaaaatnc aaactcaaca grgaaactgg gaagaaantt 960
 gggagttmcc gaaatt 976

<210> 208
 <211> 660
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (560)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (567)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (583)
 <223> n equals a,t,g, or c

<220>

125

<221> misc feature

<222> (589)

<223> n equals a,t,g, or c

<400> 208

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ccacgcgtcc gccgacacgt cgggattggc ggctgcagcc aggggtcctc cgacgctggg 60
cttccgtgag cggcgctctg ccaggtgggg ccggagctgc ggggagggag ttggcgcccta 120
gcgcgcactc catccccgcc tctgcagtgg actcggccgc agaatcgggg tcccgggctc 180
ctggaacttg tcccscccag gccgcggcga ggaggtcact ccagccgac tctggaccgg 240
attcgtccca ttctcgtcct catggtggac aagaaactgg tgggtggtttt cggaggcaca 300
ggtgcccagg gtggctccgt ggcccgcaca ctcctggaag atgggacatt caaggttcga 360
gtggtgaccc gaaaccctag gaagaaggca gcaaaggagc tgaggctgca aggtgcagaa 420
gtagtgcagg gagaccaaga tgaccaggtc atcatggagc tggccctgaa tggggcttac 480
gscaccttya tcgtgaccaa ttatgggaga gctkcagcca ggagcaggag gtmaagcagg 540
ggaagcttct tgctgatctn gccaagngcc ttgggcttca ctntgtggnc ttcaaggggc 600
cttgaggaca ataaagaagg ttacgggaag ggagatttgc cgccggggaa cttttaccgg 660

```

<210> 209

<211> 514

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (56)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (464)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (467)

<223> n equals a,t,g, or c

<400> 209

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tggaaccaat ctttgtggta catattccag ctttttgaat gagtgcatat ccagtnagta 60
ccttttaaagt aacactttgt acataacaar tactcagcaa atgtgaaact ttattttgctc 120
ttactttcaaa attagtccaa aatgttggaa ataaaatata agacattgat ctagatatga 180
ggttttttctc cttcattctc agctgtcgaa gaaatcraag tagcatatgc acaaggwtaa 240
aaaccacata tacaaatact atagaacagc ttataatgaa aaccttgccct gcctttataa 300
aaaatgtgat tatcttcttc tgttaatgtc aataaaaagat ggttttgtcct agaaggctta 360
taaattggat tatgttcttg agggtttaca tatgaaaaat gtagaaaata caaaaagtggt 420
ctatatatac aaaaatgtaa gtgttaacat ttttatattt gcctcnagc ttttttttta 480
aataaaaagga atgccatatt gccattaaaa aaaa 514

```

<210> 210

<211> 173

<212> DNA

126

<213> Homo sapiens

<400> 210

```

gtcaatgctc tgaaatctgt ggagcaaacc acagtttcat gcccatcgtc ctagaattaa 60
ttcccctaaa aatcttttgaa atagggcccg tattttaccct atagcacccc ctctaccccc 120
tctagagcca aaaaaaaaaa aaaaaaaaaa aaaaccctgg gggggggggc cgg 173

```

<210> 211

<211> 1521

<212> DNA

<213> Homo sapiens

<400> 211

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gctatcaaaa tcatgacatt atgtcacttg gagcaacaca gttgaccgcg caaggcagcc 60
tcttcctcca tagatggatg aacgctgttg ccgctgctcc tkcmctggcc atgccctgay 120
gctgccaaaca ccaactgctcc tctattttata agtcttarta gagttgctga cccagcaata 180
actgaacagc tgatatgtac ctcacactaa gccagcgct tcatatgtat ctaacttgaa 240
aaatgctgag ctagttacct taacaccatt aactttttact taaaagtttg tttttctttt 300
ttaatcccag tgagctccaa acaagtttta ggaggtctcc caaaaccagt gaagacttta 360
actaaaagta gaattttcaa gtattagaaa ccaaacccca aaattaaatg tgaagatcag 420
tgtctgtact gagctggccc atctgggtgga cacaggattt gcgttatcga ctgcaatggt 480
accaggatt caggttttct agcatctgtc agggtttaaga aaattggatt gagtacccaa 540
tacagcagag caaaccgcgg tttgaggcaa gggcccccac aagtagtcat gcagtacttt 600
tgttaggggt ctgggtgcaa atcttcctcg tccctcccac cttctcctgg cctccttgta 660
aacccaaacc gccagggtacc tcaattttct tcaagaccag gctgttctta atgttggtta 720
attggtcaag gaaatgggtg agccactgct tgctctgcac atcgctcctca gagtgtctcg 780
tcttcaggca gtacagcagc tgcatggctt tggcctgcag gagtaagtgg cccatttcct 840
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ggttatagat ggtgaaggag atgctgcccc ggtcgagcgt tttgtccacc tgccagggtg 960
acaggagtgg gttgggggca ccacgcagag catcttgtac ctgcgcgaca cctgctggta 1020
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ggtgaaatgg ccctacacca aagtgggaga cattcagaat cgaggcgaaa ttggcctcag 1260
tgctcctctt ggaggcagag aagcagtagg agtcgggtgg gaaatggccc tgtgtgaatg 1320
tggaagacca gcagattgga ggtggaattg gcctcagtgc ttgtcctgga ggtggagaag 1380
cggtcagagt ccttggtggg gaagtggccc tgcacaaaac gttgtctccc cttggccggt 1440
gaaagaataa aagaaagctg gccacttgca aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1500
aaaaaaaaaa aaaaaactcg a 1521

```

<210> 212

<211> 1875

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1052)

<223> n equals a,t,g, or c

<220>

127

<221> misc feature
 <222> (1291)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1849)
 <223> n equals a,t,g, or c

<400> 212
 gtctgctgtt gtcagaaggc agggaggggtg atgaaggact gacccacatg gactgggatg 60
 tgtgtcgggt atgggcatga ctgcacgttc actctcagtg ggatctgggc aacatggagt 120
 tcattgtcct gttgcttact tactgcaatg tctttggccc tccttttcaa ctggttcctc 180
 tgttggggccc aaagggttggg agtaggagac agtatcccag gctgacaagg gcttgccytt 240
 taccttgggc accttgtaa tttttagcct gtgcccttcc ccacctttgc cctcccagtg 300
 gttggtatgt gggaagccca tctcagttcc tgtgacttca tgtctcaaac caaggatgag 360
 cgtctggtct ctgctatgat ggtgggtatcc gaggccttcc cctgcccagt ctgggtgctg 420
 cccacattg tacgggacac tggattcctg gaccccttcc tcctttcctt tctttccttc 480
 aggtcacgca gccctgtact gtatccagca ccacagaaac ctcagtgttt ttcctctgct 540
 ggtttggggc acaaggaagc cttagggtat ggggaaaggc tgttattacc tagagtttac 600
 tcccaggcca gggggctgcc atcttcttca cagacatccc tgaaaggaag cccctttggg 660
 gcagggaggt gaggacttca tctcaacatc ggctgggtgg tggtagggga gcttttyctt 720
 ttctttcctt tttttttgtt tttgtttttg tttttgtttt tggtaacatg ttaggagtta 780
 atgttgcaaa gagtagttta catcttcaact ttctgaagac acttgaattt aggaccgatg 840
 tatctgtgac aagcatgcca gaagtggcag gggccatcag ggctaaccac ttcacacctta 900
 ccatcgtccc atggggatcc aagacctgag ataaagcaac agcctgccc gatccctctg 960
 ttcacctat ccttccaag gttggtccat gccaacataa cctctgggca tcagacatca 1020
 gcagggtctgt gtgcctcagc cctgttaagg gncagggttcc tcttttagccc tcttcctgca 1080
 cttgggagca aaggcactac cagtagagaa gggccatcca gccgtgcccc agcctggacc 1140
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 gttccattgt agctcttttt tttttttttt tccctttcct ggtgattgat tttacaaaag 1260
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 tagttacgga gggtagaggt tgtttttttg caaaaagcct gggtagagtg atctgaatta 1380
 tctggcacc tcctgaatgg aaccccagag tacctcctgt gtggaagggc ccctggattt 1440
 tccctaacac ccacctctc ccccttcagc catgctgatg gcagagaaga taagaacttg 1500
 gagcccatth ctcactggag aggaaaactt gtcactctggc tttgctggaga aggttccacc 1560
 ttacgtctgt agtacattat ctttactatg tgctaggata tcatatttaa aaggacaaaa 1620
 aaatgtaaaa tacttgaatg agcttgtatt ataacattaa tattattgag agtatctgct 1680
 ttccaggctg aagtgattca ttcattatcc tagtctgct ttagtccttt gtaatttgtg 1740
 gtaattatgc ttttcttttt aatacaaaaa aatgtataaa aataaacact tgaaaaggca 1800
 aaaaaaaaaa aaaaaaaaaa aaaactcgag gggggggcccg tacccaatnc gccggatagt 1860
 gatcgataa caatc 1875

<210> 213
 <211> 1917
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (798)

128

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (802)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1073)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1748)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1829)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1887)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1891)

<223> n equals a,t,g, or c

<400> 213

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gaattcggca cgaggcagtg gtgtgatctc agctcactgc aacctccacg tcttggggttc 60
atgcaattgt cctgcctcag cctcccaagt agctgggatt acagacatgt gccaccatgc 120
ccggctaatt tttgtatttt tagtagagac ggggtttcac tatgttgggc aggctgatct 180
caaaactcctg acctcaagtg atccaccccc ctccggcctcc caaagtgcta ggattacagg 240
catgagccac catgtctggc cctacttttc ttttatgcct tctttttgga ttaatcaaat 300
atttagtttc attacccac tattaacttt ttctattata tattcttttt ttaattaagt 360
gattaccctt gggttgttac atacatcctg aacttcttat agtaaatata catgattaat 420
ttaacctctt ccctagcaat gctcagattt tagaacatta taattccatt tagtctcttc 480
taccttttgt tttattgttt tcatgtattg taatcctaaa catattttac accccacaag 540
acaatatatt agtgttgcat atcctcaata ttcattttaga ttaatccata caattactct 600
ttctattgtc ttctactcct tactgaattt ctaggctttt atctgaaatt attttccttc 660
tgctgaaga actacctttt atagtaattt tagtgtaatt ctgcttarga agtattatct 720
gttcttggtt ttctgacaac attttcattt ctccctcatt tttgcaggat gtttttgctg 780
ggtgtatttt ctgggtcngt antyctagat tacagttact ttcttcacta cttatattct 840
cactgccacc attttattga aagtcagcac caaatcaatt aaaaactgaa ggtaatatatt 900
ctccccctca ggctgttawt aatttttttc yttgaccttg gtttttawta gkgttactgt 960
aatgtgcaa gatgtgmctt tctttawatt catcctgctt gggattttca ggaattcatg 1020
cctcagggct ttatgtcttt cattagtttt gggaaaattt taagccatta acntttcaaa 1080

```


129

```

gatcatctct tccctattct ctcttyctct ctctgctatc cttttgraac tccaattmca 1140
tgaaagtttag atttgttcat gttattcctt acgtttctta tgttcttttt tatattttcc 1200
atctttttcc ctctctgagt gtcagctctg tgataaggta gtcttgagga cttgtgtctg 1260
ctggaaggaa ctgatctgac ttggagamcc tcaaaaaagc tctatctctg gatattcatg 1320
aaaagaatag caattagaag caatctgctc aaagtcagca ttgcaactgc ttagggctgc 1380
aatatagggtt gaggcaccaa gagactagca aatattttat agggttacct gagaaacaag 1440
agagccacaa gggactttga taagctctat aatatgtctg taatgttcct gggaatttag 1500
aaggttgtgt gcatgttcaa ggctgcatgc atgttcagga aataccaaca ggggccaagt 1560
tacttattca tctcttactg accttggagc tcagtgttaag caggcaatga aacctaaaggc 1620
aaatttataa actgcctgaa ctttgaaggc atgtggaaac tcataaacag cttctctcag 1680
ccagttgcag aagatttact tattcaagtc atttaagaaa accttctaac ccaaaatttc 1740
ccatgctncc tgagatgacc aggacctaga agtagctaaa atagaacaga tttaaaaagt 1800
acataattct gtggagatct gaggctttta ctagcttgaa tgtacaacac acaacctgtg 1860
ggtgggataa attaagcata aacttgncta naaaaaaaaa actcaggggc cggccat 1917

```

<210> 214

<211> 1544

<212> DNA

<213> Homo sapiens

<400> 214

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ggcacgagct atagcaatct ggggttttctt agccaattga aatgggcatt tattagatca 60
tttaagcatc atatcaatat agtatatttg ggcactttat gataagttct tatgatagat 120
gttcaaaact ctgctcagggt gacattttta tggatccaca tagtttttgt catatatgaa 180
aagaaagcat tgagttgtgc agatgggttaa atgtgcattg agttatttct ctggaatttg 240
catgagaatg gaccgacttg tagttgtatt aacttttcta gtgcccagggt tagaaagttt 300
gatctgtgta gttttttaaag gcagcatcca aatcacttat attcagaaga aaatggtaac 360
agatttagaa gctgtctata ttttccccat tatccataat acatattatt ggcaatatgg 420
ttttcactct ttgttggttaa cgtatcaaca atgtgcaata gccactaata atcatttgtt 480
aatgcatgct tccaagttct gtatttgaaa atctcagact tcatatatgg taagtgatgg 540
agtaatttat aacttttatg ttgaattctt gctactttta aaaattgtgc ttctcctttt 600
ttaaagcata tgacttactt aacagctgat agtcagttac ctggattttt agtatttttt 660
tacatcacia aaagatttct ctgaagtttg cgcaggggtc tattttagg cagtttccaa 720
cttactaata agtaaggttc tgaaagttat aagttagctg tctggaatag atagtctcat 780
agaaaccagg ttgtagatgg tgatttgggt ccttgggcaa cctactgaaa cccatttact 840
atataatgtg gctgaataat attattgata gtgctatagt atttagcaac tgtctgtcaa 900
gtgattttga actctcatth ttgaaatctaa ctttcatagc attatactga tgaatttttg 960
gtagtgcgat ttgacttttt ctacctccat tctaccagtt cacagcgcct tctagcagtg 1020
gaaatcaaaa aacctattga gatggaattt gggaggaaag gaggacttac tgatatccct 1080
agctgtagaa agaaagtaac tgggtatcct gtctgaaaga ggaaggatgt gatgatcttc 1140
atggctctgt tgtggagatg tatgtctgct tatacatggc aggcaaccaa ttggagggtt 1200
atatatttta aaaaataaag aaggggcggc cgggcgcctg gctcacgcct gtaatcccaa 1260
cactttggga ggccgagggc ggcagatcac ggggtcagga gatcgagacc atcctggcta 1320
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gcctgtaatc ccagctactc aggaggcgga ggcaggagaa tggcgcgaa cccgggagggc 1440
gagcttgcag tgagccgaga tggctccact gcactccagc ctgggcgaca cagcgagact 1500
ccgtctcaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaa 1544

```

<210> 215

<211> 1762

<212> DNA

130

<213> Homo sapiens

<400> 215

```

catgagccac tgcaccacgc cgatactact atatcccat ttacagatg agcacatggg 60
caaattgagg gtaaggcact gacccatgat catacagctg agaagtggca aaggcaggat 120
ttgaacctag aacctctggc tccacacact agtaatctaa accactctcc ctacaataca 180
acatacgtgg taaagatgtg tgggtgggcac gcaatcaacg taggtccctt cacagttgct 240
gggagaggca ggaatttgca gtccctccgc gttctctcc tccgctgccc acctgtcctg 300
ggtcattcct gcagcctgcc ctgccctgcc tgggtctcacc ctccctctgc caacagaagt 360
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cctctttgca ggagggcgta ggggagggga ccagggtgat ttgggtcctg gctggtcacc 480
agggaagctg gcaagggaag ggagactagg gtgcgctcta ggagaagccg acagcctgag 540
agtcccagaa gaggagccct gtggaccctc ccctgccagc cactccctta ccctgggtat 600
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acaaggtggg cttcaacacg ttgcagggcg ggaagtgggg cagcgaggag aggaagagga 960
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gccagccctt ccggcccccag ggacccccga tgatgccacc ttaccctggg cccggacatt 1200
gccatcaaca gctgaacagc ctgcccacca tgggaaggacc cccaaccttc aaccgcctg 1260
tgccatattt cgggagggtg caaggagggc tcacagctcg aagaaccatc atcatcaagg 1320
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acatagctct gcacattaat ccccgcatgg gcaacggtac cgtgggtccg aacagccttc 1440
tgaatggctc gtggggatcc gaggagaaga agatcaccca caaccattt ggtcccggac 1500
agtctcttga tctgtccatt cgctgtggct tggatcgctt caagggtttac gccaatggcc 1560
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tccaggggtg tgtcaccttg tcctatgtcc agatctaata tattcctggg gccataactc 1680
atgggaaaac agaattatcc cctaggactc ctttctaagc ccctaataaa atgtctgagg 1740
gtgtctcatg aaaaaaaaaa aa 1762

```

<210> 216

<211> 253

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (236)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (238)

<223> n equals a,t,g, or c

<400> 216

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gggtaaata gtagcagggc cggcaagccc ccgctcccc ggctctcggg gtcgcgcgag 60

```

131

```

gatgcttggc acgtaccccg tgtacatact tcccggggcg ccagcatgga aataaagcac 120
ccascrcctgc cctggggcccc tgcgaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 180
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaagggg ggccgntnta 240
aaaggttccc tcg 253

```

```

<210> 217
<211> 511
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (471)
<223> n equals a,t,g, or c

```

```

<400> 217
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ggcagctgct cgaaagagta ccgctgtgct cttggccagc tccagaagca gacagatctc 180
atgcaggaca ccagcagact cctggacccc tatgtaagca cctggggcct tgtggcatct 240
gagtctcaga gaactatggg gttaggaagg gagtgagaag cagggaggac aggcctagcc 300
ccactccata tggccaggtc ggggaactga gtcgctatgt tattccagcc ttaaccctga 360
ggagctaagg ctggccctcc agctttccta gctctgtggg cccggggcgg gactccggac 420
accatcacca tgctmactgc ttactcagtg tgtttcctgc acacctgcca ngcttctggg 480
ctaggcaatg ggacgtagca gtgaagcaag a 511

```

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<210> 218
<211> 2945
<212> DNA
<213> Homo sapiens

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<400> 218
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tgaagttcaa atctcagtggt ctagaaataa agttttattc gcacacagcc tgctcatttg 180
tttacctatt gtgcatggcc actttcacat tacagtggca gagttgaaca gctgctgcag 240
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tcattttaaag taatagattt aaacagttct cataagcagc tgctggcttt gaaggtaggt 360
gcagccacta gtgcttttct tggcagattc attgccaagg aacagtttgt taagtaattc 420
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```

132

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ctgatctcat tggatttttt ttttttcttg agacagagtc ttgctctgtc acccagtcac 1200
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```

<210> 219

<211> 445

<212> DNA

<213> Homo sapiens

<400> 219

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accagaatgg cttagtacag ctagggagct cagccagatc tcggtgtctg ctgtttgaga 180
ttgtgtggaa ggactattgc taagaagcag gagacagact gaaccagtg ttggccacaa 240
gtgaggactg agaccaggt cacctcttgg ctgaacatgt tagcttgttg gtaaattggc 300
ctgcagtggg tctgcatttt agtggggaat ttgttttggg tcattttggc attcccgcaa 360
ccatcttgtt ggttttttgg taaaatgtgg caccocytc agacctytta gctgtggaam 420
tgagrtatct tagcagggtc ccgtt 445

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<210> 220

<211> 522

<212> DNA

<213> Homo sapiens

133

<220>
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 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (417)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (480)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (482)
 <223> n equals a,t,g, or c

<400> 220
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 ttgacaagtg aatgaagttc acatctggaa atcgttgaac atttttcggt catggaactc 180
 aatggctacg ttagtcgttt atgcttttca ctgttggtgg aggggctttg gaagtaaatg 240
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 tgccacctgg gcaatattgg ccgctaaggg tctctttatt cnccttactt ggacttnctt 420
 tcctggaggg aatctcccga aaaaggaaac tttccttccc cagggggggcc ccaatgggtn 480
 cnagggctgg cttcaaaatg ggttcccca ctggtggcat ca 522

<210> 221
 <211> 1516
 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (1493)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1497)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1508)
 <223> n equals a,t,g, or c

134

<220>
 <221> misc feature
 <222> (1509)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1516)
 <223> n equals a,t,g, or c

<400> 221
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 taatgatctg gttggggact cctgtgacac caatcaggac agtcatggag atgggcacca 360
 ggacagcaca gacaactgcc ccaccgtcat taacagtgcc cagctggaca ccgataagga 420
 tgggaattggg gacgagtgtg atgatgatga tgacaatgat ggtatcccag acctgggtgcc 480
 ccctggacca gacaactgcc ggctgggtccc caaccaggcc caggaggata gcaacagcga 540
 cggagtggga gacatctgtg agtctgactt tgaccaggac cagggtcatcg atcggatcga 600
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 tatatatatt aacttcaatt ttcttttagct tttaccaacc caaatatatc aaaacgtttt 1440
 atgtgaatgt ggcaataaaag gagaagagat cattttttaa aaaaaaaaaa aanttcnngg 1500
 gggcccgnnc caattn 1516

<210> 222
 <211> 1387
 <212> DNA
 <213> Homo sapiens

<400> 222
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 tcagctgctg tcgtcccagg gtggagccca ctgctacttc aggaggggcc tgctcagggt 180
 tagttaccac aggtgatggc tgagttcaga aacaaccagg gggaagtgga aggaagaaag 240
 gcaaaaagca tgaagggaca gacaactggg aagaaccagg acaatcctgt gattgatgaa 300
 atagacttcc ttgaagcttt taaaaatatt cagccctcat cgtttcgaag cgtcattgga 360

135

```

ttaatggata tcaagcctgt tgactgggag gagattggtg gccttgaaga tgtaaaactg 420
aagttaaaac agagcattga gtggcctctg aaattccctt gggaatttgt tagaatgggc 480
ctgacacaac caaagggagt tctcctctat gggccccctg gatgtgctaa aaccactctg 540
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gccagcaaga caggatgtga tgttcaagaa cgagttcttt ctgttctcct gaatgaatta 780
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acaaaac 1387

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<210> 223

<211> 1506

<212> DNA

<213> Homo sapiens

<400> 223

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cctttgctct agaatgggtc cagcttggct ttggctactg ggaacaggga tcctggcctc 120
tgtccactgt cagccccctt ttgcccattg agataaaaagt ctgcaggggc ctcaaccccc 180
caggcatcag ctctcagagc cagccccgcg ctaccacaga atcacaccca ccattaccaa 240
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aaaaaa 1506

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136

<210> 224
 <211> 896
 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (18)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (40)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (45)
 <223> n equals a,t,g, or c

<400> 224
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 gccaaagtcag cttcttctga gagagtctct agaagacatg atgctacact cagctttggg 180
 tctctgcctc ttactcgtca cagtttcttc caaccttgcc attgcaataa aaaaggaaaa 240
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 agaaatggct cagaataagt tcatcatgct aaaccttatg catgaaacca ctgataagaa 480
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 tacccttatt gatagaaaac atgaagaaag cattaagact tattcagtca gagctataag 660
 agatgataga aaaaagcctt cacttcaaag aagtcaaatt tcatgaagaa aacctctggc 720
 acattgacaa atactaaatg tgcaagtata tagattttgt aatattacta tttagttttt 780
 ttaatgtgtt tgcaatagtc ttattaaaat aaatgttttt taaaaaaaaa aaaaaaaaaa 840
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaa 896

<210> 225
 <211> 127
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (94)
 <223> n equals a,t,g, or c

<400> 225
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 ctttctgact ctaagtggca ttcaaggtaa gggncatcaa aggggtacttg aatttgtaag 120

137

atgagat

127

<210> 226

<211> 1949

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1466)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1540)

<223> n equals a,t,g, or c

<400> 226

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ccggttgaaa ccgttggcgg gcgctggctg agaggcaatg tttgctgtct tccattggag 120
tgactgaatt tctacatgac ggctttttga caagacttaa aacctgtctt ggatagagaa 180
tatttagcca ttacctaata aatgggtattt ttacatgca atgcatgtgg tgaatcagtg 240
aagaaaatac aagtggaaaa gcatgtgtct gtttgagaaa actgtgaatg cttttcttgc 300
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gaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1949

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138

<210> 227

<211> 1179

<212> DNA

<213> Homo sapiens

<400> 227

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cactgatcct ggccccctct tatttattct acatccttgg caccctactt gcactgaaag 1080
aggctttttt ttaaatagaa gaaatgaggt ttcttaaagc ttatttttat aaagcttttt 1140
cataaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1179
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<210> 228

<211> 1958

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (374)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (377)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1244)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1300)

139

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1311)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1327)

<223> n equals a,t,g, or c

<400> 228

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gtcctgcagg ctgtaatgca gtttaatcag agtgccattt ttttttttgt tcaaattgatt 1860
ttaattattg gaatgcacaa tttttttaat atgcaataaa aaagtttaaa aacttaaaaa 1920
aaaaaaaaaa aaaaaaaagg gcggccgctc tagaggat 1958

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<210> 229

<211> 1751

<212> DNA

<213> Homo sapiens

140

<220>
<221> misc feature
<222> (1741)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1742)
<223> n equals a,t,g, or c

<400> 229
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cacttgaaca aacctgggtg tctttggaaa taaatcacca ttagatttca cctggttatg 180
ctgcatccca taagtcccaa atgaatcacc tgcttacctt attaacgaag catttaattc 240
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tgaatggcaa atatgtcttg acattacttg gatgaactgt ggctagcaaa atggaattaa 540
cttagccact ataatttttt aaaacattaa agttttctaa ttgtttttgg gggccgagta 600
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nnaaaaaggg c 1751

<210> 230
<211> 2153
<212> DNA
<213> Homo sapiens

<400> 230
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141

```

ccccatattgtg gtctgtgagc cacccttaac actgggttcc ttgctctttg atatgcctac 180
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<210> 231

<211> 1360

<212> DNA

<213> Homo sapiens

<400> 231

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actaccctc cagcaactgg gaggtgggac tgtcagaagc tggcccaggg tgggtggtcag 180
ctgggtcagg gacctacggc acctgctgga ccacctcgcc ttctccatcg aagcagggaa 240
gtgggagcct cgagccctcg ggtggaagct gaccccaagc cacccttcac ctggacagga 300
tgagagtgtc aggtgtgctt cgcctcctgg ccctcatctt tgccatagtc acgacatgga 360
tgtttattcg aagctacatg agcttcagca tgaaaaccat ccgtctgcca cgctggctgg 420
cctcggccac caaggagatc cagggttaaaa agtacaagtg tggcctcatc aagccctgcc 480
cagccaacta ctttgcgttt aaaatctgca gtggggccgc aacgtcgtgg gccctactat 540
gtgctttgaa gaccgcatga tcatgagtcc tgtgaaaaac aatgtgggca gaggcctaaa 600

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142

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catcgcttgg tgaatggaac cacgggagct gtgctgggac agaaggcatt tgacatgtac 660
tctggagatg ttatgcacct agtgaaattc cttaaagaaa ttccggggggg tgcactggtg 720
ctggtggctc ctacgacgat ccagggacca aaatgaacga tgaaagcagg aaactctttc 780
tgacttgggg agttcctacg caaaacaact gggcttccgg gacagctggg tcttcatagg 840
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tgcaggtcct tgccccttgt gtcgcccctt tctctctcgg aaacaaaacc ctcccacagc 1140
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atggggtcct tttgtcaggg acttctgacg gctggtcctg aggaaggcca aactgcccag 1260
attgagccca attaaatttt atttttctgg ttttgaatac caaaaaaaaa aaaaaaaaaa 1320
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1360

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<210> 232

<211> 1986

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (6)

<223> n equals a,t,g, or c

<400> 232

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gtacctgctg cttggcttca acctgctctt ctggctggct ggatcggccg tcattgcttt 120
tggactatgg tttcggttcg gaggtgccat aaaggagtta tcatcagagg acaagtcccc 180
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caagggggta gctatccgac atgttcagac catgtatgaa gaggcctaca atgattacct 420
taaagacagg ggaaaaggca atgggacact catcaccttc cactcaacat ttcagtgcgt 480
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cggatttggg attgcaggtc tgacgatctt tggcatgata ttcagcatgg tctctgctg 660
tgcgatacga aactcacgag atgtgatatg aagctacttc tacatgaaaa ttgcaatcta 720
aagctttcat accaaatgtc acaggagctg tctcccagct catttttaac actgaaatga 780
cattaggatc taaaataatt tgctgtcaat tgtacatttg catgagtacg tatgtttggc 840
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cagacaatca tgtgccctat aaaagtgaat gtttatagga ctaaaaaact ttaacaact 1440
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ttttctgacc ctgctgtaaa ctactgcaac cctcacatcc tcaaagggac ttttatgtca 1560

```

143

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aactcttctg tttctccaaa tataaggaaa aaagactaaa gcaagagatc tggcagttga 1620
aaattgtggg aaagagaatt tgtatgggca ctgtatctat gaaatacctc ataacttacg 1680
tttacatggt ttcctaactt tttgtatatt tcttggatag ccacctagag aattcttcat 1740
agattaagaa ctacagtttt caccacttaa cataagtaaa acaaagtctt tcataattta 1800
accattagca tcttttgcca aaccctaaata aagaaaagca tcttctccta gttgtgtgtg 1860
ggcaacagaa acaagttaag gaaacaaaaa tacttatata tacacaggac caaataatg 1920
ttctttttat gcaaatcccc tgtggaaata aaattttcaa tgtttaaaaa aaaaaaaaaa 1980
aaaaaa 1986

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<210> 233

<211> 705

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (108)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (680)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (696)

<223> n equals a,t,g, or c

<400> 233

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aaatattgtt gtacattagg atgtatacat gtaaatataa gttacatntg tttagcatag 120
acaagcttaa cattgtagat gtttctcttc aaaaatcatc ttaaaccatt gcatttggaa 180
ttgtgttaaa tagaatgtgt gaacactgta ttagtaaaact tcatcacctt tctacttcct 240
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gctcatgtga cttttatcac atcaaaaaat atttcattaa tgattcacct ttagctctga 420
aaattaccgc gtttagtaat tatagtgggc ttataaaaaa atgcaactct ttttgatagt 480
tatttgagaa ttttgggtgaa aaatatttag ctgagggcag tatagaactt ataaaccaat 540
atattgatat tttttaaaca tttttacata taagtaaaact gccatctttg agcataacta 600
catttaaaaa taaagctgca tattttttaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 660
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<210> 234

<211> 838

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (32)

144

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (51)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (822)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (832)

<223> n equals a,t,g, or c

<400> 234

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gccctttcca tccattaaaa atgtccaagt tccaagtgat atgtgcccct aatatccacc 120
ttggatgttg gtgggttttt gaatttttgg gtgggttaatc cagttttatt ttgaaaagac 180
gtacttgaat agttacagca tatgtttgaa caggaagtag gaacatgcat acacgaagaa 240
atgctaacgg aaggattttgt tatgtttagg atcttccctt ggaaactaaa aatagaatat 300
taatgacatt actgtttgta gaatgacata tgcagatttt ctcataagca gtcatttgtgt 360
ttgccagtaa tgtttgagag acatgtaagt tgaaagtttt gctaaattat aaagctcctt 420
taattcgttg gttttgattc tcttattctc ttgtcttttc taaatgttaa caaaatatat 480
cttaacagat tacatgaaat ttaggaatta tttaaaagtt accattagct ctaaaattaa 540
gattcggatg ctttattttat agtaactgaa gctaataatg ttttatgttt tgattttttg 600
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tacactgctt ataatactaa tgtttacaga tatgtttctg tttataacca tataatacat 720
tggctttgtc atattagttt tttttgcaag tagttatgta aaagagatag ataataaaat 780
attaaataac aaaaaaaaaa raaaargctc gagtaarggc anagtggcat gngccata 838

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<210> 235

<211> 1410

<212> DNA

<213> Homo sapiens

<400> 235

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gtgtgagcct gaattttggca atgacaaggc cagggagccg agcgtgggtg gcaggtggcg 180
agtgtcctgg tacgaacggg ttgtgcagcc atgtctgggc gaactgctgg gctctgctct 240
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gccggccctg gccacggggc tggctttggg gctcgtgatt gccacgctgg ggaatatcag 360
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ggatgatgct ctcccgtact gggctctcaca gctgctcggg gggatgctcg gggctgcctt 480
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gctggccctg gctgtatgca tgggtgccat caatgagaag acaaagggcc ctctggcccc 660
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145

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ctgcatgaat cccgcccgtg cttttggacc tgcggtggtg gccaaacct ggaacttcca 780
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gccacttcct tgctttctcaa gctgacaatt ctacttttg aataaatagt ccagtgtttc 1320
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1410

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<210> 236

<211> 422

<212> DNA

<213> Homo sapiens

<400> 236

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aaactatttta gtctgtaaca gagccatatg ctgcagggct aactcacagt agaaatgggc 60
aatttcgacg cgctgtttat ctttaccag ctccaccagg cgttcggcaa catcaattgc 120
tttctgccac tcactggtag cctggtagat ttgtagcaac tggtgcagcg cgccaatgcg 180
gaagtcagtt tcatcggtca gctgattgaa catgtcttcc gcgcgggtcat ataaccgggc 240
ggccatgtaa tcacgccccca gttgttgaat cgccaacaga cgctgttcat aggtcagcga 300
ggcgctttcc attaggggtct gatggatgcg aatagcgcgg ttcaacttcg ccacgggaacg 360
ggaacagggtt ttccgagcgt aagggtgggct tcaacggtgc ccgttattcc tgttttaagc 420
at 422

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<210> 237

<211> 351

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (253)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (322)

<223> n equals a,t,g, or c

<400> 237

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ctgtccctgc actccgtggc ggaaggcggc tagagcggct ccctctgagc tctccgagag 60
attggtcggg acctgaagcg ttgagggttaa gggcaaggca aggagcaacg aggagttttt 120
cgttacgtta gaaaaatttc gttgcgtgct gaaagcgctt ttacctgtgt tgtatgattt 180
aaccttatga aaatggacag tatttccagt tttacaagtg aggaaagaag attaagaaac 240
ttgcctccgc cangcgtggg ggttcaactc ctgtaatccc agcactttcg gcggccgaag 300
caagcggatc acttgagggtc angagttoga agaccagcct gggccaaaca t 351

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146

<210> 238
 <211> 2682
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (647)
 <223> n equals a,t,g, or c

<400> 238
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 tatctttgat gtgggggttg aagaggaatt aaagcaaatt attaaacttt tgccaacacg 120
 tagacagact atgctctttt ctgccacca aactcgaaaa gttgaagacc tggcaaggat 180
 ttctctgaaa aaggagccat tgtatgttgg cgttgatgat gataaagcga atgcaacagt 240
 ggatggtctt gaacagaaga accgaaagaa gaagcttatg gtcttctttt catcttgtat 300
 gtctgtgaaa taccactatg agttgctgaa ctacattgat ttgcccgtct tggccattca 360
 tggaaagcaa aagcaaaata agcgtacaac cacattcttc cagttctgca atgcagattc 420
 gggaaacacta ttgtgtacgg atgtggcagc gagaggacta gacattcctg aagtcgactg 480
 gattgttcag tatgaccctc cggatgaccc taaggaatat attcatcgtg tgggtagaac 540
 agccagaggc ytaaatggga gagggcatgc ctigtctcatt ttgcgccag aagaattggg 600
 ttttcttcgt tacttgaaac aatccaagg tccattaagt gaatttngac ttttctcgtt 660
 ctaaaatttc tgacattcag tctcagcttg agaaattgat tgaaaagaat tactttcttc 720
 ataagtcagc ccaggaagca tataagtcac acatacgagc ctatgattcc cattctctga 780
 aacagatctt taatgttaat aacctaaatt tgcctcaggc tgctctgtca tttgggttca 840
 aggtgcctcc cttcgttgat ctgaacgtca acagtaatga aggcaagcag aaaaagcgag 900
 gaggtggttg tggatttggc taccagaaaa ccaagaaagt tgagaaatcc aaaatcttta 960
 aacacattag caagaaatca tctgacagca ggcagttctc tctactgaaca catgccttcc 1020
 tttcatcttg aataactttg tcctaaaatg aatttttttt ccccttgatt taacaggatt 1080
 tttgtagact ttagaatttg gacttaccta acaagagtat aaattgactt gggttgcaag 1140
 cactgagcac tgttacttct atcacgtctc tcttttattt ctgggatata aaacaggctt 1200
 taagtttctt ggttgcccaa gggcagagca aggaatatct ggtgtttctt gtgatgataa 1260
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 aatgctgcag tataaaagag caaagagctt tgggaaatac ctaagaagca ccttaagatt 1560
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 aaaaaaaaca gcaaaatcag tgatttagtc agatgagttt ttcgttgtag gagcacttga 2100
 tttctagtgt gttttgtaca gtatataact acaagatagt acattttgta gcagttcaaa 2160
 gccaaagtgt ctgacatcat tttgctgttg tgccagttaa tcataggatc ccattaaata 2220
 agtgtgctaa catcgaatat agagaaaact ggtaaagaac attccagtag gaaaagaaaa 2280
 gaacaatctt ccatttctgg gcttggccac catcaccttg gtcggacctg tcctggactt 2340
 ccaaccttga ctgctgagct cctggcttag cttcttgggt tcctaattcc tgggtgtttaa 2400

147

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taattctctc cacgatcatg tttttctgat tttttttttc agaaataatg ttttttaaaa 2460
gacaaaaaca aagggaagaa tatttaatta ctgagcagaa gtaaatactg ttgggtatttt 2520
gtacataatc taatttttat atgcatgtty atgcttttta atttttttat caaaaattaa 2580
gtcatctacc tactacttgt aaccagcttg tttcataaca tgttattttc ctgtgtcatt 2640
aaataattac ttcaatgttg aaaaaaaaaa aaaaaaaaaa aa 2682

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<210> 239

<211> 2254

<212> DNA

<213> Homo sapiens

<400> 239

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gataatattt aatgttggtc tgcacatctc tatacagtta actttttggc tttcattctg 60
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tcaaattccac aatatgctgt ataataccgg ttttactata taatctattt tagacatagc 180
tgtttagaac tagagtgtgc tattttttgtg tttttctgat gtgtgggtgct agacaagtta 240
cttttgtgaa caacaaaaat tatccctttt attcctagac aataccacct ttgggtcttg 300
ttaatttcac tgagtataac tatataattg tatatatata catatatata tatatctacc 360
tatgccaac tggcagctgt atcagagtgc tggatttggg acatgctttt ctctttaaat 420
acataatatc attatataaa ttattctaga gtgtatttaa ttaggataaa attacttcct 480
tagtatggat atttgacatc tatagggtga atttgtttat aaatatggct atatggaaac 540
ttattagcat ttactttatg tttgctactt ggctttacag catatctcct aagctgaaaa 600
ataatttgcc aggccttcaa gatcctaaag aaacttgttt aatggagtaa tatacttttt 660
tttcttatta aggaattgta ttactggcac ctaacacagt tgtattctta gtcctatta 720
tagataatgg gcatttacat aaaaatccct agatggcttg atggcagaat aaacctttcc 780
ctcctacct gagtcatgag aaggatggag acgtcctctg ccataacatg ggccataaag 840
caaattcgac atgggatgtt ctgtttcagt atgacctcaa ccagttccat gaactgagtg 900
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tccaagatc tattggcatt attgaaaagc aaagtttatc aaatatctaa ctaaggatgt 1020
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ttttgtaact gaaggtgata aattctcaag ccatgattat tggcttccat gcactgcaat 1200
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catttaaaaa gaccacatga aatgctgatt ctaatttgtg taggtcttg aggattaagc 1680
acacaaattt cacaaacttc tgtttgagta aacaaactca gccttctgta aatatacatg 1740
caagtttggg aacagtaata ctgtacctat aaatatatgc tgtctgtttt gtgtacagta 1800
tgtaaaaaact ctttttctgc cacactaaaa atgcaagcca tttatgggaa tcctaaaact 1860
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tattgagtcc tgaattttaa aaaaaaatat tttgattcat tttgtaaata caagctgtac 2040
aaaaaagaga gatttaaatgt tgtcttttaa atactccaat tttcattcta atatgaatgt 2100
tgttatattg tacttagaaa ctgtaccttt aatattacat taccctttatt aaaagtgc 2160
tgaacacatc aattttagat gtgctttatg tactgttatc ctataataaa acttcagctt 2220
ctaattggaa aaaaaaaaaa aaaaaaaact cgag 2254

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148

<210> 240
 <211> 1057
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (958)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (966)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1035)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1053)
 <223> n equals a,t,g, or c

<400> 240
 ttaactcaaa ctctaaagtc ttgagtgttt caaagtcagt cgttacctgt ttaaaagcct 60
 cagcctttag cttattcctc cttcaataca cgggaccttt gggttaatttg gggcaggaaa 120
 actcttaaag taatctctct tgggcagagg ccttattgca ccagagggaa aaagtatata 180
 cttcatttgc tgttactcca gttatgcctt aaattcattt gcttggtaat cctatcaacg 240
 rgcactaact tcttagtata ctttaaacac ttagttgggt aacactgaga ttttgtgtgc 300
 ctttattttt tgctgagatg gagtcagtca gatgttagtc atagctaaca ccgaatttgt 360
 gttgtcattt agacagttac tgattcgatc tgctttatat atgagaacgt atttttaact 420
 attccaagaa ggaagaggta gctaaatgta atccccctctt cctatcccc cagaaaaactg 480
 aactgtaagt tctaggtaga ctaattggga gcagacacgg agtttttagat gccttagcca 540
 aaccagcag aaacctttca cacagccact catcgtaaga aacgcagatt tttctcttct 600
 catgcttgtc tctggttccc tgcatttgta gtgacagaac tttcactagc aggatataaa 660
 gaaagtaatt atgcttggag tccctcttta ctgggtttga gttagggtgca taacatggaa 720
 aggagtgggtg ccttcaaatg aatgtgacca ctccgtattg tggagtgact tccctagggc 780
 atcctataca tcctaccaca gaaggccaag ggacagagca ccaacttcag tatccaagaa 840
 attagatcca caactcttga tttccacac tgaggactgt cgcgagtaag ttgtaagttt 900
 gccgtcttcc ttctggctta gcaggtgctg cagctgtact ctcgactcct gtctgtgnag 960
 cgtganyagg gaaaatgagg agtggagtct atttccaaaa aaaaatgtgg atggagtttt 1020
 ttccttaaag tggcnttcatt tggccaatt ccttttt 1057

<210> 241
 <211> 498
 <212> DNA
 <213> Homo sapiens

<220>

149

<221> misc feature
 <222> (493)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (496)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (497)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (498)
 <223> n equals a,t,g, or c

<400> 241
 gagttgatcc tgagatgaag gtggagcgtt acaagcgcac ctttgaccaa aatgaggagc 60
 tagggctcaa tgacatgaag acagagggct atgaggcagg cctggctccg caacggtagc 120
 agtgggtggc tcaagggcca gcctccagcg ctgctctttc tgtaggttat ttattagtat 180
 tggatgaagg cgaaggctgg gagtgtcttt cccaccagcc cttgcccattg gtggggagga 240
 catctgggtct gagtcagaga tctgtgcaca ctttctaaac agcttgtgat gcaagtgtga 300
 gcctattgtg ttacttgacc ttatitttga agttttgaat tggcctagga ggaaacccag 360
 aaatgaacca ggggtatgtc atcacttttt tcatatcaag tcctcaccct ccttccacat 420
 aatgctctat cctctaargt tggaactctg aarttggaga argtggaata aagttacacc 480
 tggaaaaaaa aanaannn 498

<210> 242
 <211> 1784
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (1739)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1777)
 <223> n equals a,t,g, or c

<400> 242
 ggcacgagcc aacccagcta tggcctatgc caacgaggtg aaacgtgtgg tcagcagtgc 60
 acaggagaag ggcaggaaga ttgcagcctt ctctcgctgag tctctgcca gtgtgggagg 120
 gcagatcatt cccctgctg gctacttctc ccaagtggca gagcacatcc gcaaggccgg 180
 aggggtcttt gttgcmgatg agatccaggt tggctttggc cgggtaggca agcacttctg 240
 ggccttccag ctccaggga aagacttcgt ccctgacatc gtcaccatgg gcaagtccat 300

150

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tggcaacggc caccctgttg cctgcgtggc cgcaaccag cctgtggcga gggcatttga 360
agccaccggg ttgagtactt caacacgttt gggggcagcc cagtgtcctg cgctgtgggg 420
ctggccgtcc tgaatgtctt ggagaaggag cagcyccagg atcatgccac cagtgtaggc 480
agcttcctga tgcagctcct cgggcagcaa aaaatcaaac atcccatcgt cggggatgtc 540
aggggtgttg ggctcttcat tgggtgtgat ctgatcaaa atgaggccac aaggacacca 600
gcaactgaag aggtctgycta cttggtatca aggtgaagg agaactacgt tttgctgagc 660
actgatggcc ctgggaggaa matcctgaag tttaagcccc caatgtgctt cagcctggac 720
aatgcacggc aggtgggtggc aaagctggat gccattctga ctgacatgga agagaagggtg 780
agaagttgtg aaacgctgag gctccagccc taagccagcc ctgctctgcc taagtgtact 840
ccagaagaaa ctcatctcat ccaaatacac gctattgaga aggcgagcct gacctccctc 900
ttacagataa agtcagcttt cagaggctca ggggtgggggg gcctgcccga ggccataatg 960
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tcaagtcagt caatttcctt tctgtccact gggggtggaa tggggtaggg tgggatactt 1080
taaagtgtc ctgcttaaat aaattagacc agaccagtgt atttctaaag aaaatcctga 1140
catgcacacc cattaaaaat agtacathtt acagtgtccc agtcatactt ttaattggca 1200
aattaaaata atgcaatctg atatatctta tcctactaaa ttaaaaatac tgaatataac 1260
caactaaata tacttactcc taagactcac taccagtagt ttcacttaaa ctctgcctta 1320
gaggctcttc ccacccattt cccattatgg cacatagaga aaaaggcctc tatcactgtc 1380
cactggagta ataaccactg cttcccctaa ctgcctcaaa gactgtcatt ttatagaaaa 1440
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cctgccactg caggccgcam cctcaactcc caactgccaa cttgaagcct gaactaccct 1620
ttccctgacc agagttcagg aggggaagag ctacacctcc ctgcacatga atccactcat 1680
ttgaaagcac aactgaccct ggatttaagc tggccaggac cctgggagat ctttgggaang 1740
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<210> 243

<211> 936

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (840)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (854)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (865)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (905)

<223> n equals a,t,g, or c

151

<400> 243

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catatgtttg cttgggatag aggtcaaaga ggatcctctg gcatgttttg ctgggttctt 60
gtagtcattt caacaggatt aactataatc tataattgat agattattga gtgacacaca 120
gcgtgatgct gggcaggccc caagctgaaa agcatctctt ccaacttact ttattcttag 180
caattcattc ctttggtttg aaaattcttc agcatcttca agagtccttt actaatgsat 240
cctttggggg agtttgtgcta aattatcaac tcacaaggat gagatkgtct gctctaggga 300
gccagcctgc caacatggat gggctgtccc aggstctcaa gtgagctcag gtctgtacac 360
tgcaactccrg ggagagtaaa tgtgcctggg gcatagaatg gagacttttg agtttgagg 420
ttggagtggtg tttggggaca tcagcttctc tcttccagtt agtctgataa gtcctttgtt 480
gcctggccct ggaaaccact tgtstctccga aaatgccatt ctctggaatg tagctgtgga 540
gtagggagag agttggcccc tgtgttctgt aacccaagca agtactgtct cactgccatc 600
ttggggcaga ctccgcagta aggagaatct ctcttgccct tttgtgtttc ttggtttctt 660
cctttgtaaa tacaaggcat agtctctgcc ctccccccag attgccagaa gagtgggata 720
tattgttcta gcaatataaa gctctgaggc ctttctgcag gactgtagac accactttgc 780
tgtgatagtg aagaatgtgg gggagtggtg tgagggctag gcgaagcggc ccggccttgn 840
cccattgaca gctncagtct tcctnccctc ataacttttt taacctaaaca gaggatttaa 900
aaaaaanaaaa caatttttagc tggggcacaa tggctc 936
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<210> 244

<211> 1381

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1348)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1349)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1350)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1358)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1359)

<223> n equals a,t,g, or c

<400> 244

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tccgtgggtg ggttgactct gaggatctgc ccctgaacat ctcccgagaa atgctccagc 60
agagcaaaaat cttgaaagtc attcgcaaaa acattgttaa gaagtgcctt gagctcttct 120
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152

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ctgagctggc agaagacaag gagaattaca agaaattcta tgaggcattc tctaaaaatc 180
tcaagcttgg aatccacgaa gactccacta accgccgccg cctgtctgag ctgctgcgct 240
atcatacctc ccagtctgga gatgagatga catctctgtc agagtatgtt tctcgcatga 300
aggagacaca gaagtccatc tattacatca ctggtgagag caaagagcag gtggccaact 360
cagcttttgt ggagcgagtg cggaaacggg gcttcgaggt ggtatatatg accgagccca 420
ttgacgagta ctgtgtgcag cagctcaagg aatttgatgg gaagagcctg gtctcagtta 480
ccaaggaggg tctggagctg cctgaggatg aggaggagaa gaagaagatg gaagagagca 540
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gctggacagc caatatggag cggatcatga aagcccaggc acttcgggac aactccacca 720
tggtctatat gatggccaaa aagcacctgg agatcaaccc tgaccacccc attgtggaga 780
cgctgcggca gaaggctgag gccgacaaga atgataaggc agttaaggac ctggtggtgc 840
tgctgtttga aaccgccctg ctatcttctg gcttttccct tgaggatccc cagacccact 900
ccaaccgcat ctatcgcatg atcaagctag gtctaggtat tgatgaagat gaagtggcag 960
cagaggaacc caatgctgca gttcctgatg agatcccccc tctcgagggc gatgaggatg 1020
cgtctcgcat ggaagaagtc gattaggtta ggagttcata gttggaaaac ttgtgccctt 1080
gtatagtgtc cccatgggct cccactgcag cctcgagtgc ccctgtccca cctggctccc 1140
cctgctggtg tctagtgttt ttttccctct cctgtccttg tgttgaaggc agtaaaactaa 1200
gggtgtcaag cccattccc tctctactct tgacagcagg attggatgtt gtgtattgtg 1260
gtttatttta ttttcttcat tttgttctga aattaaagta tgcaaaataa agaatatgcc 1320
gtttttatac aaaaaaaaaa aaaaaaannn gggggggngg ccccggtccc matttcccc 1380
c

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<210> 245

<211> 779

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (10)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (39)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (41)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (650)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (669)

153

<223> n equals a,t,g, or c

<400> 245

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cttttccttn caggtggaaa ggaccccttg gtacccatnc ncaagcagtt aggaaaggac 60
ctggctcttt acatatattg gatggtcctc atggcaaac ttctcaattc cttaattagt 120
catgtctcag cttcaaggat atcagacagg aatgaaacac acttgaaaat gagattgacc 180
tggagatttt ttttccctaa tctctcatat ctttaattgga aaaataatca attaatctta 240
tgttaattag grtatataaaa gttcacccctc cttgmaagtg actagggcaa gccctgaaga 300
tcttcctcac ctcccttttat ctttctataa ccttggtctcc tccagcacca cagggaagac 360
aatcacagtg ggtcaagagc gaccctcttt cacgtgggct ctgcatgacc tctgagacct 420
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tggggcaaatg ggtgatttac ttatcccat tctaaatgga gtgagctctc tttgaggcta 540
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tcttcttttt aaactcactt aatatgcctt aatcatctgk gtgtaatggg agtcatccgc 660
tcctcaatnt aaccctyctm ccctggggct ttggctgtcc tcaatgagag tttcatgcag 720
aatggaaaat cctctatatg tacaatctct ctccccctca tttctcttcc tcctcacct 779
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<210> 246

<211> 1231

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (795)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1219)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1229)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1230)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1231)

<223> n equals a,t,g, or c

<400> 246

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ccacgcgtcc ggaagaaggc ctaattccta acctgggacc cagagagaga cataagatat 60
ccagagagat atgcaccaag aaactgcaat ttatacaaag acagtcagaa agcagctgaa 120
gacagaatga gagagaaact aagtaaaaga aacttgatgc ctccaaaatg aagagtatgc 180
```

154

```

ctcatttcca tatgtgaact gaaaagctct ccacttttga aataaaggct tactatagag 240
cagccctggg aatagaacta caagacttat aataacttcc tgtttgagtt gaaatgaaaa 300
ctcataaaga atctatgcta ttaacccctt aatttatact tttgtattct tttatgttgt 360
attttgtatt ttatgttgga cttctttttt aaaattttgt atttattttt aattgaaaaa 420
taattgtgta tacttattgt tgtacaacat gatgttttga tatatgtata tgtttagtaa 480
tgactaaatc aagctagtta acatatgcat tacctcctat acttatcatt tatttgtggg 540
gagaacattt aaaatctact ctgttagcaa ttttgaagta tagaatacac tatgtcaact 600
ataatcatgg tgttgtacag taggtctaaa tgtattcatt tctcctatct aactgaaaat 660
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ttatatagat aaacncaagt catgggactg tgttgtacag attattttgt cgtccacgta 840
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tcaagttggc ctaatgtcta ttgttccctt ctttgaaca accactctaa tctctgcttc 960
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gctgatggca gatgtttgaa ttgtttccag tttttgagta ttatgaataa tgctgttgtg 1140
aacaaaaaaa aaaaaaaaaa aaaaaaaggg cggccgctct agaggatcca agcttgcgta 1200
cgcgctgcag aaacgtcana agggctctnn n 1231

```

<210> 247

<211> 851

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (817)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (834)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (842)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (844)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (849)

<223> n equals a,t,g, or c

<400> 247

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155

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acgacgccac catggacctg gagcagcagc ggcagcttgt gagcaccctg gagaagaagc 120
agcgcaagtt tgaccagctt ctggcagagg agaaggcagc tgtacttcgg gcagtggagg 180
aacgtgagcg ggccgaggca gagggccggg agcgtgaggc tcgggccctg tcaactgacac 240
gggcactgga ggargagcag gaggcacgtg aggagctgga gcggcagaac cgggccctgc 300
ggctgagctg gaggcactgc tgagcagcaa ggatgacgtc ggcaagagcg tgcattgarct 360
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gcggaggcag ctggccaagc agctgagaga tgcaagggtg gagcgggatg aggagcggaa 600
gcagcgcact ctggccgtgg ctgcccgaac gaagctggag ggagagctgg aggagctgaa 660
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gcaggcccag atgaaggagc tatggcggga ggtggaggag acacgcacct tccgggagga 780
gatcttctcc cagaatcggg aaagtgaana ggcctnaag ggctgaagc tgangtgctg 840
cngntgcang a 851

```

<210> 248

<211> 1802

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1680)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1747)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1757)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1800)

<223> n equals a,t,g, or c

<400> 248

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gttcttgtat tgatgaagtg aaacaaagtg gggccattgt tcattttatt gctttgggaa 180
gagctgctga tgaagcagta atagagatga gcaagataac aggaggaagt catttttatg 240
tttcagatga agctcagaac aatggcctca ttgatgcttt tggggctytt acatcaggaa 300
atactgatct ctccsagaag tcccttcagc tcgaaagtaa gggattaaca ctgaatagta 360
atgcctggat gaacgacact gtcataattg atagtacagt gggaaaggac acgttctttc 420
tcatcacatg gaacagtctg cctcccagta tttctctytg ggatcccagt ggaacaataa 480
tggaaaatth cacagtggat gcaacttcca aaatggccta tctyagtatt ccaggaactg 540
saaagggtggg cacttgggca tacaatctty aagccaaagc gamcccagaa acmttaacta 600

```

156

```

ttacagtwac ttctcgagca kcaaaattct tctgtgectc caatcacagt gaatgctaaa 660
atgaataagg acgtaaacag tttccccagc ccaatgattg tttacgcaga aattctacaa 720
ggatatgtac ctgttcttgg agccaatgtg actgctttca ttgaatcaca gaatggacat 780
acagaagttt tggaaactttt ggataatggg gcaggcgctg attctttcaa gaatgatgga 840
gtctactcca ggtatttttac agcatataca gaaaatggca gatatagctt aaaagtctcg 900
gctcatggag gagcaaacac tgccaggcta aaattacggc ctccactgaa tagagccgcg 960
tacataccag gctgggtagt gaacggggaa attgaagcaa acccgccaag acctgaaatt 1020
gatgaggata ctacagaccac cttggaggat ttcagccgaa cagcatccgg aggtkcattt 1080
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accttgatgc cacagttcat gaggataaga ttattcttac atggacagca ccaggagata 1200
attttgatgt tggaaaagtt caacgktata tyataagaat aagtgcaggt attcttgatc 1260
taagagacag ttttgatgat gctcttcaag taaatactac tgatctgtca ccaaaggagg 1320
ccaactccaa ggaaagcttt gcatttaaac cagaaaatat ctcagaagaa aatgcaaccc 1380
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aagtaaagga tatttctgaa tcttaaaatt catcccatgt gtgatcataa actcataaaa 1740
ataattntaa gatgtcngga aaaggatact ttgattaaaa taaaaacact catggatatn 1800
ta 1802

```

<210> 249

<211> 444

<212> DNA

<213> Homo sapiens

<400> 249

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gggtgccttt ctcatggcca cagcagcttg gcttacaacc gtcttcaaac agccaggctg 60
tgccccagaa cttcactggg cttccttcca taactatgga tctgtgagca tcactttaat 120
ttcagagtgt ggaagacacc ttaataagaa tcatgaatca cattttaca atcaggatata 180
acaggatgta aggttaagtg acctgtccta tcagggccac aaagccagtt aaacttcttt 240
attaactgag tcacttaaaa atcatttatt taaaaaccta ttttgttcca ggaactattc 300
tgggtactgg aaatraaaac agtggagaca gagagagggg aaataaaaaa caagacaaaa 360
atgattgctt tkgtggagtt tatatatcc actggargaa ggtagatsat aaataaaaagt 420
gaaaaagtac attatwaggt ggga 444

```

<210> 250

<211> 1746

<212> DNA

<213> Homo sapiens

<400> 250

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ggcatcagta aggtctgtat ttaaatgtgg atgtagacat cataattacc aagacaagaa 60
attgttttga gaaattctct gatgtttttc ttcttcagggt ttcacgtgcc acgatcatgg 120
tgccacggta ctgcagtatg caccctaaaca gcaactccta atctcggggg gtaggaaaaa 180
acacgtctgc atttttgaca tcargcaaag gcagctcatt cacacgttcc aggcccatga 240
ctcagctatt aaggctctgg ccttggatcc ctatgaggaa tattttacca cagggttcagc 300
agaaggtaac ataaagggtt ggagattgac aggccatggc ctaattcatt catttaaaa 360
tgaacatgct aagcagtcca tatttcgaaa cattggggct ggagtcatgc agattgacat 420
catccagggc aatcggctct tctcctgtgg tgcagatggc acgctgaaaa ccagggtttt 480

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157

```

gcccaatgct ttttaacatcc ctaacagaat tottgacatt ctataaagat tgggggtttta 540
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taagcagttg tattgaaaac agagaatctc tgtgtagaat ttgaatatga cccaagctga 660
gtattatcta aacaggttgg tggaaatgaat gcgcatgtac cttattatgc tgacatacta 720
aaaaaaaaataa aacctagtat tgtatgaagg atagctattc ttacagcat ttagcaaacc 780
tgattcagaa aacatttgag attagcaaatt tagtaacttg aaataatgaa aaggacgttt 840
ataccaaatt aaggaagaaa atgttgctga tttgggtttt tcttcctgtt cttaccactg 900
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tgttgaaact acaccaatag agcatttcat atcataatta aaatgaatgt taggcttctt 1380
gtggccagtt aatagttgat gagattgggtg acattattta ttgccacagc ctattgtata 1440
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gtatttccctt ggttatgacc aaaaatatgt tgagatactg aaactaatgt ctgtgtgttt 1560
aaatgtttac cagcaaatgt tcttatcatg ttaatgagaa tgttcaatgc ctgtgtggta 1620
aatagtaaat acaatggcat aaaagtaact ttctctgaag atgtgatgtt caggctgtga 1680
aatatatatg taaaagaaaa ataaatgtta tttgttagaa aaaaaaaaaa aaaaaaaaaa 1740
ctcgta 1746

```

<210> 251

<211> 1935

<212> DNA

<213> Homo sapiens

<400> 251

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gaattcggca cgaggggagca ttgcccgtca gacagcaact cagagaataa ccagagaaca 60
accagattga aacaatggag gatctttgtg tggcaaacac actctttgcc ctcaatttat 120
tcaagcatct ggcaaaaagca agccccaccc agaacctctt cctctcccca tggagcatct 180
cgtccaccat ggccatggtc tacatgggct ccagggggcag caccgaagac cagatggcca 240
aggtgcttca gtttaaatgaa gtgggagcca atgcagttac ccccatgact ccagagaact 300
ttaccagctg tgggttcatg cagcagatcc agaagggtag ttatcctgat gcgattttgc 360
aggcacaagc tgcagataaa atccattcat ccttccgctc tctcagctct gcaatcaatg 420
catccacagc gaattattta ctggaaaagt tcaataagct gtttggtgag aagtctgcga 480
gcttccgga agaataatatt cgactctgtc agaaatatta ctctcagaa cccagggcag 540
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tggctcctgt gaatgctgtc tacttcaaag gaaagtggaa aactccattt gagaagaaac 720
taaatgggct ttatcctttc cgtgtaaaact cggctcagcg cacacctgta cagatgatgt 780
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ttatgacagg gagaactgga catggaggcc cacagtttgt ggcagatcat ctttttcttt 1260
ttcttattat gcataagata accaactgca ttttattttt cggcagatgt tcctcaccct 1320

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158

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aaaactaagc gtgctgcttc tgcaaaagat ttttgtagat gagctgtgtg cctcagaatt 1380
gctattttcaa attgccaaaa atttagagat gttttctaca tatttctgct cttctgaaca 1440
acttctgcta cccactaaat aaaaacacag aaataattag acaattgtct attataacat 1500
gacaacccta ttaatcattt ggtcttctaa aatgggatca tgcccattta gattttcctt 1560
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gtgagttttt aaattattgc tcaactgccta tttaatgtag ctaataaagt tatagaagca 1680
gatgatctgt taatttccta tctaataaat gcctttaatt gttctcataa tgaagaataa 1740
gtaggtatcc ctccatgccc ttctgtaata aatatctgga aaaaacatta aacaataggc 1800
aaatatatgt tatgtgcatt tctagaaata cataacacat atatatgtct gtatcttata 1860
ttcaattgca agtatataat aaataaacct gcttccaaac aacaaaaaaaa aaaaaaaaaa 1920
aactttgagg gggggg                                     1935

```

<210> 252

<211> 1919

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (253)

<223> n equals a,t,g, or c

<400> 252

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ataaggcggc atttatcatt cccaccactg acatctactg tataccacat ctgctatgcc 60
atggatacat ggcatcatga tgatgagtc cccccctggg cctgccaaagg ggaaacagag 120
tgcatatccc accataatag ggaaattaat aattgtatta agtggttgaa aaaaaggggg 180
aggatgttca ctcaactgtt cctgtgtagt atcctgcaaa tgcatgaatg gtgaactccc 240
catgtcagca ttnttggtgc cattttattha gtaccagac atagtgtgg tctcacagct 300
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caatggaagg atgcaggcca acctctttga ttacaattga gattcatgtg actattgagc 480
cctggaaatg tagcttgtcc aaattgagat gtgctgtcag tataaaatac ataccagatt 540
ttaaagatgt accaaaaaat gtaaaactat tcaattttta tattggtgaa atcaatatgt 600
cttggtatag tggcttaaat aaaacaatth tagcctttct cagttttatt ttctgcaaaa 660
agattaaaaa ttgtacatga agctcatgtt aactttcttt tggtcagtgc tattttaaag 720
gaagtatgag ttgaaaaaaa attgaaataa actatatcat attactagga cttaatatag 780
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tttatgaatt aaacagggaa cggcatgctg aacttgaaac tagatttggt cctgcttttt 1080
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gttggtggaa gagcagcatt ttgacccttg gagaagaaaa actagctgtg gcattccagg 1560
tgagagaacct gacagaggac taagaagtta tctaattgta aagacctcag gcaccacctt 1620
cgcataaact ttttccagac aaggctaaat gtgcatgctt cataaccata attcttattt 1680

```

159

```

ttctttaata aatatttttc tacttgtaac actgtgcatt atttcaaact gtttacctgt 1740
ttgtaaagct tgtctcttaa tcaaatttgt cttgacccaa taagtttcct gagggctgga 1800
attatgcctt aactatatct atagtattta acagtgaatc ctttgtataa tgaaagcatc 1860
aacagataat tttaaattga taaataaaaa gcacagtttc aaatggtaaa aaaaaaaaaa 1919

```

<210> 253

<211> 2468

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2076)

<223> n equals a,t,g, or c

<400> 253

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aggacaggag gtggccatta agcagatgaa tcttcagcag cagcccaaga aagagctgat 120
tattaatgag atcctgggtca tgagggaaaa caagaaccca aacattgtga attacttgga 180
cagttacctc gtgggagatg agctgtgggt tgttatggaa tacttggtcg gaggctcctt 240
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gagcaccatg gtaggaaccc catactggat ggcaccagag gttgtgacac gaaaggccta 420
tggggcccaag gttgacatct ggtccctggg catcatggcc atcgaaatga ttgaagggga 480
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gaagattgcc aagccctctt ccagcctcac tccactgatt gctgcagcta aggaggcaac 720
aaagaacaat cactaaaacc acactcacc cagcctcatt gtgccaagcc ttctgtgaga 780
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ccatgacttt ggctcagctg atcctgacat gggagaacaa ccacattttt ctttgtgtgt 1320
gcttctagca gctgttcggg aggaccttga cccaayagtg ttcccatgct gtttcttgtg 1380
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gttgagaagt cggggaaaat ggtgactact tttagagcaa ggctgggcat cagcacctgt 1560
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ctgaaagatt aacttgatc tttcaatggg ccaaatcttt tggtcacaa aaagagtctc 1680
caaattagag actgcatgtt agttctggat ggatttggtg gcctgacatg ataccctgcc 1740
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tcatgctctg aggtactact gcctctgcag cacaaatttc tatttctgtc aataaaaagga 1980
gatgaaaata ttctatttga gtatgccttt cttttttctc ttcgtttttt ctttcctttt 2040
ctaatttttt atatgaaata atgagtaagt ttcttntctga accatttgag agtggttaagt 2100

```

160

```

tgcagataga atgccccctt accactatat acctgaatgt gtattctttc yttttaacac 2160
ttttatttta aatataaatt aagagaaatg ggccaaaacc atttgtattg tttaaagaat 2220
aattataaac acacttgtat ccaccaaatac aagaaakgga aactgacag taagaacctt 2280
ctctatcttg tccttccttt ctcatatag cccccaccta agaggtaacc accatcttga 2340
cttttatttta aataactttc ttgcttttct gtatactttc atcacattca ggtgtgttcc 2400
aatacaagta gatcttagtt cggccagttt ttgaacttta aataaacata tcataataga 2460
taaaaaaaa                                     2468

```

<210> 254

<211> 2861

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2861)

<223> n equals a,t,g, or c

<400> 254

```

ggcacarcca cagcttctcc agtggctatg tggagatgga gtttgagttt gaccggctga 60
gggccttcca ggctatgcag gtccactgta acaacatgca cacgctggga gcccgctctgc 120
ctggcggggt ggaatgtcgc ttccggcggtg gccctgccat ggctgggag ggggagccca 180
tgcgccacaa cctagggggc aacctggggg accccagagc ccgggctgtc tcagtgtccc 240
ttggcggccg tgtggctcgc tttctgcagt gccgcttccct ctttgcgggg ccctgggttac 300
tcttcagcga aatctccttc atctctgatg tggatgaacaa ttctctccg gcaactgggag 360
gcaccttccc gccagccccc tgggtggccgc ctggcccacc tcccaccaac ttcagcagct 420
tggagctgga gccagaggc cagcagcccg tggccaaggc cgaggggagc ccgaccgcca 480
tcctcatcgg ctgcctgggtg gccatcatcc tgctcctgct gctcatcatt gccctcatgc 540
tctggcggct gcaactgggc aggytcctca gcaaggytga acggagggtg ttggaagagg 600
agctgacggt tcacctctct gtccctgggg acactatcct catcaacaac cgcccagggtc 660
ctagagagcc acccccgtac caggagcccc ggccctcggtg gaatccgccc cactcygctc 720
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gggagttcct ccgggaccag ggccggcagg tgtacctgtc ccggccgcct gcctgcccgc 1860
aggcytatat gagctgatgc ttcggtgctg gagccgggag tctgagcagc gaccaccctt 1920

```


161

```

ttcccagctg catcggttcc tggcagagga tgcactcaac acggtgtgaa tcacacatcc 1980
agctgccccct ccttcagggg gcgatccagg ggaagccagt gacactaaaa caagaggaca 2040
caatggcacc tctgcccctc cctccccgac agcccatac ctctaataga ggcagtgaga 2100
ctgcagggtgg gctggggccca cccaggggagc tgatgccccct tctccccctc ctggacacac 2160
tctcatgtcc ccttctgtgt cttctcttct agaagccccct gtcgcccacc cagctgggtcc 2220
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ataggataga cactggacat ggcccattgg agcacctggg cccactgga caacactgat 2340
tcctggagag gtgggtgcgc ccccagcttc tctctccctg tcacacactg gacccactg 2400
gctgagaatc tgggggtgag gaggacaaga aggagaggaa aatgtttcct tgtgcctgct 2460
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caacggccca tagccttggg gttggacatc tctagtgtag ctgccacatt gatttttcta 2700
taatcacttg gggtttgtac atttttgggg ggagagacac agatttttac actaatatat 2760
ggacctagct tgaggcaatt ttaatccct gcactaggca ggtataata aagggtgagt 2820
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```

<210> 255

<211> 766

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (107)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (709)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (722)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (732)

<223> n equals a,t,g, or c

<400> 255

```

aaaggggggtc gagtaactca agtggttagaa gttcggtgac ttttgactgg ggagaaagga 60
accttaaaact tggggaggag aaggggagtcc tggagttgtt acctanaaac aaagatgggg 120
cggaatggag gctacagccc gaaagccagg ccagcagtgg cgttcttctg tgtccccaag 180
tagtggaactt gagcccgtc agacctcggc aggagtctcg tcccagggca ggtgggtgtg 240
cgggggtgagc cgcggagcgg ttccagctcg ggtaaagagg aagttacctc gggtcctttg 300
cactccaact cggcggcgcc cgagcccagag gggccccagc caacccgacg cccgtgtgtt 360
gtgtgtgtct aacacccggg ccgtgcercg gccgcgcgcg ccgcgctgcc cccagctcga 420
ggaggacatc gcggccaagg agaagttgct gcgggtgtcg gaggacgagc gggaccgggt 480

```

162

```

gctggaggag ctgcacaagg cggaggacag cctcctggcc gccgaagagg ccgcgccaag 540
gctgaagccc gacgtagctt ctctgaacag acgcatccag ctgggttgagg aagagttgga 600
tcgtgcccag gagcgtctgg caacagcttt gcagaagctg gaggaagctg ataaggcagc 660
agatgagagt gagagaggca tgaaagtcac tgagagtcga gccc aaaang gatgaagaaa 720
anatggaaat tnaggagatc caactgaaag aggcaaagca cattgc 766

```

<210> 256

<211> 1394

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1238)

<223> n equals a,t,g, or c

<400> 256

```

gcccacgcgt ccgagctcag tcagcagaag agataaaagc aaacaggtct gggaggcagt 60
tctgttgcca ctctctctcc tgtcaatgat ggatctcaga aatacccag ccaaattctct 120
ggacaagttc attgaagact atctcttgcc agacacgtgt ttccgcatgc aaatcaacca 180
tgccattgac atcatctgtg ggttcctgaa ggaaaggtgc ttccgaggta gctcctaccc 240
tgtgtgtgtg tccaaggtgg taaaggtgg ctcctcaggc aagggcacca ccctcagagg 300
ccgatctgac gctgacctgg ttgtcttctc cagtcctctc accacttttc aggatcagtt 360
aaatcgccgg ggagagttca tccaggaaat taggagacag ctggaagcct gtcaaagaga 420
gagagcattt tccgtgaagt ttgaggtcca ggctccacgc tggggcaacc cccgtgcgct 480
cagcttcgta ctgagttcgc tccagctcgg ggagggggtk gaggttcgatg tgcctgcctgc 540
ctttgatgcc ctggattttg cccgwacagg tcaattgact ggcggctata aacctaaccc 600
ccaaatctat gtcaagctca tcgaggagtgc caccgacctg cagaaagagg gcgagttctc 660
cacctgcttc acagaactac agagagactt cctgaagcag cgcaccacca agctcaagag 720
ctcatccgc ctagtcaagc actggtacca aaattgtaag aagaagcttg ggaagctgcc 780
acctcagtat gccctggagc tcctgacggt ctatgcttgg gagcgaggga gcatgaaaac 840
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gaattaccca tgctttaaga attgggatgg gtccccagtg agctcctgga ttctgctggt 1140
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atagctggag accattcttt ccaaagaact tacctctntc gcaaaggcca tttatattca 1260
tatagtgaca ggctgtgctc catattttac agtcattttg gtcacaatcg agggtttctg 1320
gaattttcac atcccttgctc cagaattcat tcccctaaga gtaataataa ataattctcta 1380
acaccaaaaa aaaa 1394

```

<210> 257

<211> 1329

<212> DNA

<213> Homo sapiens

<400> 257

```

ctcatcctca acctggtgac agacttgaag ccccagatgc tgttggacac agtgccctgt 60
atccccgcct acatcctcta catgtgcac cggctcgcgg accaaaccaa tgatgatctc 120
aaggtgcmct cctgmtgac ctccaccayc aacggcatta agraagtcct gaaraagcac 180

```

163

```

artgatgact ttgagatgac gtcattctkg ttatccaaca cctgccacct tcttcactgt 240
ctgaagcggg acagcgggga tgagggcttc atgactcaga atacwgcaaa gcacaacgaa 300
cactgyctta agaaytttga cctcaccgaa taccgtcagt actgagcgac ctttccattc 360
agatctacca gcagctcwtt aaaattgccg aggggygygt acagccgatg atagtttctg 420
ccatgttgga aaatgagagc attcaggggc tatctggtgt gaagcccacy ggctmccrga 480
agcrctcctc cagcatggca gatggggata actcatacyg cctggaagct wtcatccgcc 540
agatgaatgc ctttcataca gtcattgtgt accagggctt ggaccctgag atcatcctgc 600
aggtattcaa acagctcttc tacatgatca acgcagtgc tcttaacaac ctgctcttgc 660
ggaaggacgt ctgctcttgg agcacaggca tgcaactcag gtacaatata agtcagcttg 720
aggagtggct tcggggaaga aaccttcacc agagtggagc agttcagacc atggaacctc 780
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aactacaaga gcggaatgac cctcagcaac tgctattaga tgccaagcac atgtttcctg 1020
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caatgtgagc aagaaggaag tatatacagt aaagtaaatt caaggatctg ttaaatctgg 1200
taaaagtaga tcaaatcaga gattgacagc ctgtggaggg tgctgaacta tacagaatta 1260
gacacaacta tgtcattatt tttgtacct actgctcaga ataaaaaacac ttgaaatatg 1320
aaaaaaaaa 1329

```

<210> 258

<211> 2196

<212> DNA

<213> Homo sapiens

<400> 258

```

aattcggcag agcgggaagt cgctgaagac agagcgatgg tagttctgga ggcctcgtc 60
cggggccgac ccgaggccac agtgccctcc cggtagaccg gacttgggtg acgggctccg 120
ggctcccag gtgaagagca tcgggggctg agggatggaa gggctctaaga cgtccaacaa 180
cagcaccatg caggtgagct tcgtgtgcc gcgctgcagc cagcccctga aactggacac 240
gagtttcaag atcctggacc gtgtcaccat ccaggaaact acagctccat tacttaccac 300
agcccaggcg aaaccaggag agaccaggga ggaagagact aactcaggag aggagccatt 360
tattgaaact cctcgccagg atggtgtctc tcgcagattc atccccccag ccaggatgat 420
gtccacagaa agtgccaaca gttcactct gattggggag gcatctgatg gcggcaccat 480
ggagaacctc agccgaagac tgaaggtcac tggggacctt tttgacatca tgtcgggcca 540
gacagatgtg gatcacccac tctgtgagga atgcacagat actcttttag accagctgga 600
cactcagctc aacgtcactg aaaatgagtg tcagaactac aaacgctgtt tggagatctt 660
agagcaaatg aatgaggatg acagtgaaca gttacagatg gagctaaagg agctggcact 720
agaggaggag aggctgatcc aggagctgga agacgtggaa aagaaccgca agatagtggc 780
agaaaatctc gagaagggtc aggctgaggc tgagagactg gatcaggagg aagctcagta 840
tcagagagaa tacagtgaat ttaaaccgaca gcagctggag ctggatgatg agctgaagag 900
tgttgaaaac cagatgcgtt atgcccagac gcagctggat aagctgaaga aaaccaacgt 960
ctttaatgca acctccaca tctggcacag tggacagttt ggcacaatca ataacttcag 1020
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gactgtgttg ctgctccatg ctctggccaa taagatgggt ctgaaatttc agagataaccg 1140
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gccgttatac tgttctgggg ggttgcggtt tttctgggac aacaagtttg accatgcaat 1260
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ttttgtctt ccctacagga tggatgtgga gaaaggcaag attgaagaca caggaggcag 1380
tggcggctcc tattccatca aaaccagtt taactctgag gagcagtgga caaaagctct 1440

```

164

```

caagttcatg ctgacgaatc ttaagtgggg tcttgcttgg gtgtcctcac aattttataa 1500
caaatgactt ttttccttag ggggagggtt gccttaaagg cttttaattt tgttttgttt 1560
gcaaacatgt tttaaattaa attcgggtaa tattaaacag tacatgttta caataccaaa 1620
aaagaaaaaa tccacaaaag ccactttatt ttaaaatatc atgtgacaga tactttccag 1680
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agttggataa tgtgggaaaa tgacatctaa gctttacctg gtcaccatgt gatgtgatca 1980
gatgcttgaa atttaacact tttcacttgg ttcttatact gaatgccgac tctgctctgt 2040
gttagagata tgaaatgggtg tttgatactg tttgagacat tatggagaga ttttaattatt 2100
tgtaataaaa gatttgctgc agtctgaaaa ctgccagggt gtgcactgtt ggggttttct 2160
ttaaaataga gtactttgta ttctgggaaa aaaaaa 2196

```

<210> 259

<211> 567

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (236)

<223> n equals a,t,g, or c

<400> 259

```

gtttacataa gagatccttt agtccactca acgggtgaca ttagcagcat ctttaatata 60
actgtttgtt caaaggcaag gtgggtccctt ttaaagttac acttctagac tcacctgttc 120
tactccctg ttttaatgta acccagccat gagatgccag ataatagaat tgctacctac 180
tagctgaaca ggaaagaacc tgtgctgttt ctgacacttc ttgttgacac tagatnaata 240
caatgggtat tatagagact cagttgcaga aattaacaaa catgctgctt ggttaaaatg 300
ggtagactca tctggctcat tctttattcc attttagttg gtttgcatct tgcctaagggt 360
gcatactcca aactyttggt attattctcc tgatagtcac actagtagtc tccctgggtg 420
gctataatct ctaaaagctt taaatgtttg cwtgcagcta tccatcgaat gtcaaagggt 480
ctctcttttg ctggaatgac aaaactcaaa ggaatgtgtg atcaggaaga catcataacc 540
tatgaatgat ggaacccaaa atgaatg 567

```

<210> 260

<211> 950

<212> DNA

<213> Homo sapiens

<400> 260

```

gactaatgaa ataactgttc actattgtgg gttctacttg cagggttcag actaggcaat 60
gtggtagatg ctatacaggc aactgagcag agcattcatg ccactgacct ggtacctcgc 120
ttatgcttaa cattagccaa cctgaaccgt gtgatttatt tcatctgtga caccatcctc 180
tgggtgagga gcgtaggctt cacctctggc atcaacaaaag agaaatggcg aacgagggct 240
gctcaccact actactattc tcttctgctg agccttgtca gggatctgta tgaaatctcc 300
ctgcagatga aacgagttac atgtgacagg gcaaagaaaag agaaatcagc atcccaggat 360
cctcttttgt tcagcgtggc tgaggaggwa acagaatggc tccaatcctt tctacttctt 420
ttattccgat ctctgaagca gcatcctccc ttgctcctgg acacagtga gaacctttgt 480
gatatcctga accctttgga cctgctgggg atctataaat ccaatcctgg catcattgga 540

```

165

```

cttggagggtc ttgtgtcctc tatagcaggc atgatcactg tggcatatcc tcagatgaag 600
ctgaagaccc gttagtgttt ttaggcttgg aactagtacc tactttaaaa gatggcctct 660
tgggtgggaca gacatttcta taagtcacag gccatgtcat actgtgctta agttcttggt 720
catgtgagca tttacaacac tgtgatgtgg gcagagatga ggccaagaac ggagaaggga 780
ggagcatgaa gagttgtatg tttttggagt gctggagtga cttgtgaatt tctgaatatt 840
ttcccttcat ctaacattga ttgaacatct cttatgtgca tagtgggagc ttagtatttg 900
ctgaatgaat aaaaattgaa agggaaaaat ttaaaaaraa aaaaaaaaaa 950

```

<210> 261

<211> 475

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (444)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (451)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (454)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (470)

<223> n equals a,t,g, or c

<400> 261

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caaagaattc ggcacgaggt ctgatcttcc tgcggctgaa ccgcccggct gagccgacat 60
tgccggcgtc ttggcgattc ggcccagcga gctccgcttt cgctacagca tgggtggccta 120
ctggagacag gctggactca gctacatccg atactcccag atctgtgcaa aagcagtgag 180
agatgcactg aagacagaat tcaaagcaaa tgctgagaag acttctggca gcaacgtaaa 240
aattgtgaaa gtaaagaagg aataatctac cctgactaaa gcttgaaatg ctacatttcc 300
aagggtgaaga tgtgtgggca catgttatgg cagattgaaa aggatctcat tccatgggaa 360
aaaaaaaaat cctgtcttgt tcataaattg acaatgtcaa taaattgaaa tatgggttcac 420
tgttaaaaaa aaaaaaaaaa aaangggggg nccnttttaa agaatccaan tttac 475

```

<210> 262

<211> 1244

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1230)

166

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1232)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1235)

<223> n equals a,t,g, or c

<400> 262

```

ggcacgagga aagtactttt gctataagtt tcctaaaagt atttaatact tttttttttc 60
aathtagatt aaatctcttg atgaacagtg tgtgggttggc aaaatttcca agcactggac 120
tggaattttt agagaggcat ttacagacgc tgataacttt ggaatccagt tcccttttaga 180
ccttgatggt aaaatgaaaag ctgtaatgat tgggtgcctgt ttcctcattg acttcatggt 240
ttttgaaaagc actggcagcc aggaacaaaa atcaggagtg tggtagtgga ttagtgaaaag 300
tctcctcagg aaatctgaag tctgtatatt gattgagact atctaaactc atacctgtat 360
gaattaagct gtaaggcctg tagctctggg tgtatacttt tgcttttcaa attatagttt 420
atcttctgta taactgattt ataaagggtt ttgtacattt ttttaatactc attgtcaatt 480
tgagaaaaag gacatatgag tttttgcatt tattaatgaa acttcctttg aaaaactgct 540
ttgaattatg atctctgatt cattgtccat ttactacca aatattaact aaggccttat 600
taatttttat ataaattata tcttgtccta ttaaacttag ttacaattta tttcatgcat 660
aagagctaatt gttatttttg aaatgccata tattcaaaaa agctcaaaga taattttctt 720
tactattatg ttcaaataat attcaatatg catattatct ttaaaaagtt aaatgttttt 780
ttaatcttca agaaatcatg ctacacttaa cttctcctag aagctaactc ataccataat 840
attttcatat tcacaagata ttaaattacc aattttcaaa ttattgttag taaagaacaa 900
aatgattctc tcccaaagaa agacacattt taaatactcc ttactctaa aactctggta 960
ttataaacttt tgaaagttaa tatttctaca tgaaatgttt agctcttaca ctctatcctt 1020
cctagaaaat ggtaattgag attactcaga tattaattaa atacaatatc atatatatat 1080
tcacagagta taaacctaaa taatgatcta ttagattcaa atatttgaaa taaaaacttg 1140
attttttgtt aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1200
aaaaaaaaaa aaaaaaaaaa gggcgggccgn tntanaggat ccaa 1244

```

<210> 263

<211> 1132

<212> DNA

<213> Homo sapiens

<400> 263

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cttccaactt ggtacctgtg gatatcatag aaagtgtagt ttcaaaggag atggacaaac 60
gatacttaca gtttgatatt aaggcctttg ttgaaaataa tcctgccatt aaatgggtgtc 120
ctactccagg ctgtgacaga gcagtaagac taacgaaaca agggtc aaat acatctggat 180
ctgatacact cagcttccca ttgctgagag ctctgtctgt tgattgtgga aaaggacacc 240
tcttctgctg ggagtgcctt ggtgaagcac atgagccttg tgactgcaa acatggaaga 300
attggctgca aaaaataacc gaaatgaaac cagaagaact tgtgggagtt agtgaagcct 360
acgaggatgc cgccaattgt ctctggttat taactaactc caagccttgt gccaaactgta 420
agtctccaat acagaagaat gaaggctgca atcacatgca gtgtgctaag tgcaagtatg 480
acttttgctg gatttgcctt gaagagtgga aaaaacatag ttcgtccact ggaggttatt 540
acagatgtac tcgctatgaa gtcattcaac acgtggagga gcaatccaag gaaatgactg 600

```

167

```

tggaggctga gaaaaaacac aaacgatttc aggaacttga cagatttatg cactattata 660
caagatttaa aaaccatgag catagttatc agctagaaca acgccttctt aaaacagcca 720
aagaaaagat ggagcaattg agcagagctc tcaaagaaac tgaaggaggc tgtccagata 780
ccactttcat tgaagatgca gttcatgtgc tcttaaaaaac tcggcgcatc ctcaagtgtt 840
cttatccata tggatttttc ttggaacctt aaagcacaaa gaaagaaatt tttgaactaa 900
tgcaaacaga cctagaaatg gtcactgaag accttgccca gaaagtcaat aggccttacc 960
ttcgcacacc ccgccacaag atcatcaaag cagcatgcct tgtacagcag aagaggcaag 1020
aattcctggg catctgtggg ctcgggggag tagctcctgc agactcacca gaagcttcca 1080
aggcgcatct tgstggtggg aacatggggr ttgggggrata tttwgggggt tt 1132

```

<210> 264

<211> 499

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (447)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (466)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (467)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (469)

<223> n equals a,t,g, or c

<400> 264

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ggcacgagtg aagctgaagt actgcttcac ctgcaagatg ttccggccac cccgaacctc 60
acactgcagt gtctgcgaca actgtgtgga acgatttgac catcactgcc cctgggtggg 120
caactgtgtg gggagacgga actatcgctt cttctacgcg tttattctct cctctctcatt 180
cctgacggcc ttcactcttcg cctgtgtggt caccacactg acgttgcgcg ctgaggggaag 240
caacttcctc tccactctga aggagacacc agcaagcgtg ctgggagttg gtgatctgct 300
tcttctccat ctggtccatt ctgggcctct cagggtttca caggtacctc gtcgcctcca 360
acctgactac taatgaagac atcaaagggt cgttgggtcca gcaagagggc ggtgagcctc 420
ttgtcaaccc tacagcataa agtatnttca ccaatggcgg gtgggnntng ggccttaact 480
tccagctatt gacggggggg

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<210> 265

<211> 735

<212> DNA

<213> Homo sapiens

168

<220>
 <221> misc feature
 <222> (648)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (713)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (730)
 <223> n equals a,t,g, or c

<400> 265
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 aaaggcagcc gctgcagtcg ccacaccttt gcccctgctg cgatgacctt gtcgccactt 120
 ctgctgttcc tgccaccgct gctgctgctg ctggacgtcc ccacggcggc ggtgcaggcg 180
 tccccctctgc aagcgttaga cttctttggg aatggggccac cagttaacta caagacaggc 240
 aatctatacc tgcggggggc cctgaagaag tccaatgcac cgcttgctca tgtgacctc 300
 tactatgaag cactgtgctg tggctgccga gccttcctga tccgggagct cttcccaaca 360
 tggctgttgg tcatggagat cctcaatgtc acgctgggtg cctacggaaa cscacaggaa 420
 caaaawtktca ktggcagggt ggagttcaag tgccagcatg gagaagagga gtgcaaattc 480
 aacaagggtg aggcctgcgt gttggatgaa cttgacatgg agctagcctt cctgaccatt 540
 gtctgcatgg aagagtttga ggacatggag agaagtctgc cactatgctg cagctctacg 600
 cccaggctgt cgcagaacta tcatgagtgt gcaatgggac gcggcatnag tcatcacgca 660
 acgccacgac agatctctca gcacaaagat atgtcctggt acgcaatgga acntgagata 720
 accagtctan ctggt 735

<210> 266
 <211> 851
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (834)
 <223> n equals a,t,g, or c

<400> 266
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 ccaggagcac agctgtgatg aacagtactt gtgtcagttc tgtgaacatg aaactaatga 120
 tccagaagac ttgcatagcc atgtggtaaa tgagcatgca tgtaaattaa tagagtttaag 180
 tgataagtat aacaatggtg aacatggaca gtatagcctc ttaagcaaaa ttacctttga 240
 caaatgtaaa aacttctttg tatgtcaagt atgtgggttt cggagtagac ttcacacaaa 300
 tgtaaacagg catgttgcta ttgaacatac aaaaattttt cctcatgttt gtgatgactg 360
 tgggaaaggc ttttcaagta tgctagaata ttgcaagcat ttaaattcac atttatctga 420
 agggatttat ttatgtcaat attgtgaata ttcaacagga caaattgaag atcttaaaat 480
 tcatctagat ttcaagcatt cagctgactt gcctcataaa tgtagtgact gcttgatgag 540
 gtttggaat gaaagggaat taataagtca ccttcagtc catgagacaa cttgattatt 600

169

```

ctctttaact tacagaatgt tagtttaaaa taataaattc atcctttttt tggagatgat 660
taaattggatg attgtaaaca caacttatga aatctgcctt taacaagtaa ctttttttaa 720
ttataaaatt ttattggcat tgctccattt tctgtatata aatatatctt taatgtggta 780
ttttcaaaaa aaaaaaaaaa aaaaaaatcc acgcggccgc gaattcccgg gtcnaacaag 840
ctcactaatc c 851

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```

<210> 267
<211> 1257
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (51)
<223> n equals a,t,g, or c

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<220>
<221> misc feature
<222> (118)
<223> n equals a,t,g, or c

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```

<220>
<221> misc feature
<222> (1213)
<223> n equals a,t,g, or c

```

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<220>
<221> misc feature
<222> (1217)
<223> n equals a,t,g, or c

```

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<220>
<221> misc feature
<222> (1238)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (1245)
<223> n equals a,t,g, or c

```

```

<400> 267
tccccgtgtt tggatggatgt ggtggtcgcc aaagaagagt tagccattcc naccgcagat 60
tcaaattcga acaggccaaa gtttcagcct gtatattgcg cgcaatcatc agcggacncg 120
gtgatgaagt gatcgaaactg gcgaaaacaa atggctaagg taaaaagggg ggcatattccg 180
tcataataag gacatgccat gattgattta cgcagtgata ccgttaccgg accaagccgc 240
gccatgctcg aagcgatgat ggccgccccg gttggggacg acgtttacgg agacgaccct 300
accgttaatg ctctgcagga ctacgcagca gagctttccg gtaaagaagc cgccattttt 360
ctgcctaccg gcaactcaggc caacctggtc gctctgctca gtcactgcga acgcggcgaa 420
gagtatattg tcggtcaggc cgcgcataac tatctgtttg aagccgggtg cgcggcgggtg 480
ctgggcagta ttcaaccgca acccatagac gcggctgccg acggcacgct accgctggat 540

```

170

```

aaagtggcga tgaaaatcaa acccgacgat atccatttcg cccgcaccaa attactcagt 600
ctggaaaaca cccacaacgg caaagtgttg ccgcgggaat acctgaaaga agcatgggaa 660
tttaccgcg agcgcaatct ggcgctgcat gttgacgggtg cgcgcattctt taatgccgtg 720
gtggccttacg gctgcgaact gaaagagatc acgcaatatt gtgattcgtt caccatttgc 780
ctgtcgaaaag gtcttgggac gccagtcggt tcattactcg tcggtaatcg tgattacatt 840
aaacgtgcc a ttcgctggcg gaaaatgaca ggtggcgagg tgcgccagtc cggcattctg 900
gctgccgcg ggatatatgc cctgaaaaat aacgttgccg gcttgccagg agaccacgac 960
aacgctgcct ggatggcgga cagctgcgtg aarcargcgc ggatgtgatg cgtcaggaca 1020
ccaatatgct gtttgttcgc gtcggggaag aaaatgctgc cgcgttaggc gaatacatga 1080
aagcgagaaa cgtgctgatt aacgcctcgc cgattgtccg cctgggtgacg catcttgacg 1140
tctcgcgcga acaactggcg gaagtcgccg cccactggcg tgcattcctg gcgcgttaag 1200
gagagaaaacg ttncgcnaag cattttagtt ctccgtgnca attgntacat tgtcaac 1257

```

<210> 268

<211> 1085

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1067)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1081)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1083)

<223> n equals a,t,g, or c

<400> 268

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gcaaaatttt agcatctctc aataatcata ctttttctct ttaattatca acaaaatatt 60
ttcatgttaa gctatctctt gcattcctag aataactcta cttgatcatg atgttttttc 120
ttttaataat ggaattataa ataagtatac agtttttgta tgaaaatgtt tttatttctc 180
tggagcatgt acctatggat ggaattacta aatcatatgc tagttctgtg tttaactatt 240
tgaaggattg aaggagtgcc agattgtttt ccaaagtggc tgtaccattt tacattccta 300
cctgcagtgt atgaaggttt caatttctcc acatcctcac caatattatt atctgtcttt 360
ctgattgtag ccaccttagt ggggtgtgaag tggatatctt gtgacttgga tttgattttc 420
cctgatggct aatgatattg aacatctatc tttctctgtg cttattggtc atttgtatat 480
tttctttgga gaaatgtcta ttccagatcc yttttctgtt tttaaaaaat arctttattg 540
aggtwtatth gacaaataaa aatttgktgt atatttaaaa tgtattttaa agaaaattga 600
gagaaaggac tacagagccc cgaattaata ccaatagaag ggcaatgctt ttagattaaa 660
atgaagggtg cttaaacagc ttaaagttta gtttaaaagt ttaggtgat taaaataatt 720
tgaaggcgat cttttaaaaa gagattaaac cgaagggtgat taaaagacct tgaaatccat 780
gacgcagggg gaattgcgtc atttaaaagc tagttaacgc atttactaaa cgcagacgaa 840
aatggaaaag ttaattggga gtggtaggat gaaacaattt ggagaagata gaagtttgaa 900
gtggaaaact ggaagacaga agtacgggaa ggcgaagaaa agaatagaga agatagggaa 960
attagaagat aaaaacatac ttttagaaga aaaaagataa atttaaacct gaaaagtagg 1020

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171

aagcaraara aaaaaaaaaa aaaaaaaaaa aaaaaagggc ggccgcncctg gggccccagc 1080
ntnccg 1085

<210> 269
<211> 1315
<212> DNA
<213> Homo sapiens

<400> 269
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agaggaaacg gcgtggaggc tttgcagttc aggcgaagaa gccaaaaaga aacgaaatag 120
atgcggagcc gccagctaag cggcacgcca cagcagagga ggtggaggaa gaagagaggg 180
accggatccc aggccccgtt tgcaagggaa agtggaaaaa taaggacgg attctcatct 240
tttcttccag aggaataaat tttagaacaa gacatttaat gcaggacttg agaatgttga 300
tgcctcattc taaagcagat actaaaatgg atcgtaaagga taagctattt gtgattaacg 360
aggtttgtga aatgaagaac tgtaataaat gcatctattt tgaagctaag aaaaaacagg 420
atctctatat gtggctttca aattcacctc acggaccatc tgctaaattc cttgttcaaa 480
atattcatac cctcgctgaa ctgaagatga ctggaaactg tttgaaaggt tctcggcccc 540
ttttgtcttt tgaccctgct tttgatgaat taccacatta tgctttgkta aaagaactct 600
taattcagat ctttagtaca ccacggtatc atcccaaaag ccaaccattt gtggaccacg 660
tgtttacttt caccattttg gataatagga tatggtttcg gaactttcag atcatagaag 720
aagatgctgc tctttagtaa ataggacctc gttttgtctt aaatctcata aagattttcc 780
agggaagttt tggaggacca actttatatg aaaatcctca ctaccagtca ccaaacatgc 840
atcggcgtgt cataagatcc atcacagctg caaaatacag agagaaacag caagtgaag 900
atgtgcaaaa actgagaaaag aaagagccga agactcttct tccacatgat cccactgcag 960
atgtttttgt aacaccagct gaggagaaac caatagaaat acagtgggta aaaccagagc 1020
caaaagtga tttgaaagca agaaagaaac ggattttacaa aaggcaaaga aaaatgaaac 1080
agaggatgga cagtgggaaa acaaaataag tcaatggaaa cctgatttgt ttttcagtta 1140
ctttatatatt attttgtatt caatgtgtaa atacttttat tatctaatac tatcttacgt 1200
ctaattagtg tagcatttac aagaaagaaa aattaagatc ttaaaatcag tgattatctt 1260
tttctaaata aaatatcacc agaattcatc agttaaaaaa aaaaaaaaaa aaaaa 1315

<210> 270
<211> 2959
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (2948)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2956)
<223> n equals a,t,g, or c

<400> 270
ccattcccgg gtcgaccac gcgtccgctg gaaatttggg ttctccagaa ggtggtttcg 60
atgccatcat gcaagttgca gtttgtggat cactgattgg ctggaggaat gttacacggc 120
tgctggtgtt ttccacagat gccgggtttc actttgctgg agatgggaaa cttggtggca 180

172

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ttgttttacc aaatgatgga caatgtcacc tggaaaataa tatgtacaca atgagccatt 240
attatgatta tcttcttatt gctcaccttg tccagaaact gagtgaaaat aatattcaga 300
caatttttgc agttactgaa gaatttcagc ctgtttacaa ggagctgaaa aacttgatcc 360
ctaagtcagc agtaggaaca ttatctgcma attctagcaa tghtaattcag ttgatcattg 420
atgcatacaa tcccccttcc tcagaagtca ttttgaaaaa cggcaaattg tcagaaggmg 480
taacaataag ttacaaatct tactgcaaga acggggtgaa tggaaacagg gaaaatggaa 540
gaaaatgttc caatatttcc attggagatg aggttcaatt tgaaattagc ataacttcaa 600
ataagtgtcc aaaaaaggat tctgacagct ttaaaattag gcctctgggc tttacggagg 660
aagtagagggt tattcttcag tacatctgtg aatgtgaatg ccaaagcgaa ggcatccctg 720
aaagtcccaa gtgtcatgaa ggaaatggga catttgagtg tggcgctgc aggtgcaatg 780
aagggcgtgt tggtagacat tgtgaatgca gcacagatga agttaacagt gaagacatgg 840
atgcttactg caggaaagaa aacagttcag aaatctgcag taacaatgga gagtgcgtct 900
gcgacagtg tgtttgtagg aagagggata atacaaatga aatttattct ggcaaattct 960
gcgagtgtga taatttcaac tgtgatagat ccaatggctt aatttgtgga ggaaatgggt 1020
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ctttggatac tagtacttgt gaagccagca acggacagat ctgcaatggc cggggcatct 1140
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cgaagtatga gggaaaatga gtactgcccg tgcaaatccc acaacactga atgcaaagta 1740
gcaatttcca tagtcacagt taggtagctt tagggcaata ttgccatggg tttactcatg 1800
tgcagggtttt gaaaatgtac aatatgtata atttttaaaa tgttttatta ttttgaaaat 1860
aatgttgtaa ttcattgccag ggactgacaa aagacttgag acaggatggg tattcttgtc 1920
agctaagggtc acattgtgcc tttttgacct tttcttctctg gactattgaa atcaagctta 1980
ttggattaag tgatatttct atagcgattg aaagggcaat agttaagta atgagcatga 2040
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gttattttgc tatttgctctg ttagacatga ctgatgacat atctgaaaga caagtatgtt 2220
gagagtgtgt ggtgtaaaat acgtttgaaa tagttgatct acaaaggcca tgggaaaaat 2280
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cttaatgttt ggtaactttt atgccttcac tttacaaatt caagccttag ataaaagaac 2400
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acaaagtatt tgctgaatgg ggaccttttg agttgaattt attttattat ttttattttg 2520
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tttaatgaac atgtgaagtt atactgtggc tatgcaacag ctctcaccta cgcgagtctt 2700
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tttacagtgc tattttactga agttatttat taaatatgcc taaaatactt aaatcggatg 2880
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gaggaaanaa aaaaaanaa 2959

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<210> 271

<211> 2025

<212> DNA

173

<213> Homo sapiens

<220>

<221> misc feature

<222> (1339)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1916)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1944)

<223> n equals a,t,g, or c

<400> 271

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ttatttttaca gcctcaaata tttctcatta tcttgtcact tagttcttca tgtttctcct 60
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gagggtttcct atttttraca gttaacttgt aaatactcag gttttacgat gtataattta 180
cctaataagac caaactaact catggagata ttttgaacta ttatttaggt acaaacttta 240
taaagaatgt tagtatgtca taaaatataa cattacagct tatttaaaac caaatatagt 300
tgaacatatt taaaatacat tttcacagaa tggatgaatt agttgtttct tcagagttac 360
ttatgaacag ttgaatgctt taaaatgttc tgtctgtagg taacatctaa aacacaagtg 420
ggttttattta aattttttaa atttgaaatt ttttatttgc aaaaaattgt tttatgcttt 480
attatatcgc aaatgagtggt cagatttttg agtaccaatg atcatgcttc catttttttt 540
agtttttaaac caccaaacca atatttttcc tttaaatttt aatcttataa tatagaaatc 600
ttatgtaaat gaaattttgt catgtttcaa ataaagagaa ctgaagtaga aaatagaaat 660
gccagtaaac aacataatgt ttaatttaca acttacatta ggggtttggg ggaatgctaa 720
ttatatattg agaatatata ttagaactct tcaaaatggg ctcttctaag gaggtcacta 780
ctgaacaaaa ttgttccctc ttctgtttaa tagaatagggt ttaaagact agtcaaatga 840
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aaaacaaaaa tattgtaatc ctagaaatta tctccagctt ttctcacctg aaaatctatt 960
gaagtgatcc ctgggtcatcc taataatggg atgaggggag tttccagcag atttcagggt 1020
gttctttaaag tttttgttgg tcattttctc aatagtagat gaaatcaaga tgcttatgag 1080
catggaaatg tattttaaag ttttgcttgt gtcctcctca gtcagaatag aaaagtaact 1140
gaaatactct tacctttctg tccttgataa aatagtaaag aaaaccaaac aaaccagggt 1200
ctgatgggaa aaatgattcc tttattctag caacttactt tctgttggta tgggaaatgt 1260
tattaatttc tattactaaa gtccatatca caaaatgata ttttaataa accttgggggt 1320
aaatcatgaa ttttttttnc tacgtgtgag tataaaaagac aaaagttgaa cagcatggaa 1380
tctcattgcc aaattattag tgaatgtata gttcagggtat tctttgagac acacagtatc 1440
attaatttcc gaattgtatt tcagtgttat tttttgtttg tgaccactaa gcttctgtct 1500
taatacaaaag ctgttacctt ctacagaatt taagtctgaa gatgtaaaga gagaacagggt 1560
cttgtgtaac agaagatact cttttttatg ctccctactg tgatcacaga aaaattaaaa 1620
atccaagtgc tctctagatt tgttgataaa catttttatgc ttgcatttaa acttgaaatg 1680
tatgagcaga atgagacaat cagttaaatc agaaatgaga agtattataa tgtaaagggtc 1740
ttgttttgct gttagcaataa aatgaccaag tgcaatgact tgatttaata aaatcatatt 1800
ttaaaaagtgc tgstatgaaw atttttgggt ataaaaatttt accctgactt gstttcaata 1860
actgttacgt aatgcagttt gatgttgtaa cctaacattc caaaaaaaaa attganagggt 1920
ggaatctcaa aatagtatat actncactaa cttgttttaca ggtgctgtat ttaaaagcat 1980

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174

gcttctctct caaaaagaaa aattaaagga ttttattgcc aaacc

2025

<210> 272

<211> 852

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (767)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (769)

<223> n equals a,t,g, or c

<400> 272

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ccacccgcc caaggcccag ctaatTTTTg tatttttagt agagacaggg tttgattatg 60
ttggacaggc tggctcctaaa ctcttgactt caagtgatcc acccgctctg gcctcccaac 120
gtgawggggac tatagacatg agccatcgtg cytggccttc ttgawtcttg aatacgggggt 180
tttgagggtga aagcatttca tgaaaactta agttcataca caagagcatc atgaatattc 240
taaaagaggt atctgtgctt tttttgtgac cacaaaatat tacttcttat gaaatgttta 300
cactagggtga ggaaaagttc attaattacc tttaaaccgt tccttatttt ttttaagatt 360
ttaaattgta ttttggtctt tgctccagc atcctttctg gttgctctgg tttgaattaa 420
gttcctatta tgctgcagca catatcaacc ttccctaagt aaccatttcc tgggaatgtga 480
agcatcggtg ccattagcag accatatgca gaaatgtcgt gtacttgcac ttcttttttg 540
tgcactctat aaggctgggt gtgactcaga tcagcttaac tttttatatt atgttatttc 600
actaactgct acagtcaaaa tgatcaaata tttgtacaat agaaaattat ttaaatttta 660
tttttctact gacatttcta attctagtgt aaatgtttat caataaaaaa ttactttcaa 720
ttctgagttg gaattatatt tctttttggt ggctaaatga ggttaancnt ttggaataaa 780
aaatgacttc aagttttcaa ttttttaaaa taacttaaaa atcttagcaa ggggggaaact 840
tttttttaag gg 852
```

<210> 273

<211> 571

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (7)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (535)

<223> n equals a,t,g, or c

<400> 273

gcccantac tttccagccc agtaaggggt atttcaggag agcagtccac tkaaggttct 60

175

```

ttcccttttaa gatatgtgca ggatcaagtt gcggcacctt ttcagctgag taaccacact 120
ggccgcacatca aggtggtcctt tactccgagc atctgtaaag tgacctgcac caagggcagc 180
tgtcagaaca gctgtgagaa ggggaacacc accactctca ttagtgagaa tggtcátgct 240
gccgacaccc tgacggccac gaacttccga gtggtaatat gccatcttcc atgtatgaat 300
ggtggccagt gcagttcaag ggacaaatgt cagtgccttc caaatttcac aggaaaactt 360
tgtcagatcc cagtccatgg tgccagcgtg cstaaacttt atcagcattc ccagcagcca 420
ggcaaggcat tggggacgca tgtcatccat tcaacacata ccttgccctc gaccgtgact 480
agccagcagg agtcaaagtg aaatttcctc cttaacatag tcaatatcca tgtgnaacat 540
cctcctgaag ctcccgctcca gatacatcag g                                     571

```

<210> 274

<211> 710

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (667)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (689)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (701)

<223> n equals a,t,g, or c

<400> 274

```

gtaagtttga gagcatctgc tggaaaacca ctagaatttg caaacggcca cctcaaaata 60
ctccagccag tcccactaag ccaaagacca gaatctgaga acagggatgg ggaaattatt 120
cctttctgtg gatgattatg cagctggggc atgatttcac acccgggggc catgggctaa 180
gatggagggg aaggaaggaa tgtaatgtgt gccctctacc tcttcaccag gcatcatcct 240
ctcactggcc ctggctggca ttcttggcat ctgtattgtg gtggtggtgt ccatttggct 300
tttcagaagg aagagtatca aaaaagggtg taacaaggga gtcatttaca agccagccac 360
caagatggag actgaggccc acgcttgagg tccccggagc tcccggggca catccaggaa 420
ggaccttgct ttgggacctt acacacttcg gctctctgga cacttgcgac acytcaaggt 480
gttctctgta gctcaatctg caaacatgcc aggccctcagg gatcctctgc tgggtgcctc 540
cttgcccttg ggaccatggc caaccagag ccattccgatt cgatggatgg ggatgcactc 600
ttcagaccaa gccagcagga attccaaagc tgcttgctgt aaatgtgtga gattgtgaat 660
gggctgnatt ctggattcaa aaccagccng ctggtggggc ntaaggttgg 710

```

<210> 275

<211> 595

<212> DNA

<213> Homo sapiens

<400> 275

```

taaaagagtg tcctaacagt ccccgggcta gagaggacta aggaaaacag agagagtgtt 60

```

176

```

acgcaggagc aagcctttca tttccttggg gggggagggg ggcgggtgcc tggagagggc 120
cgggggtcggg gaggttgggg ggtgtcagcc aaaacgtgga ggtgtccctc tgcacgcagc 180
cctcgccccg cgtggcgctg acactgtatt cttatgttgt ttgaaaatgc tatttatatt 240
gtaaagaagc gggcgggtgc cctgctgcc cttgtccctt gggggtcaca cccatccctt 300
ggtgggctcc tgggcggcct gcgcagatgg gccacagaag ggcaggccgg agctgcacac 360
tctccccacg aaggatatct tgtgtcttac tctgtgcaaa gacgcggcaa aaccagtgcc 420
cctgggttttt cccacccgga gatgaaggat acgctgtatt ttttgccata tgtccctgcc 480
tctagggttca taatgaatta aaggttcatg aacgctgcga aaaaaaaaaa aaaaaaaatt 540
tgccctatca gtgagtcgga ttaattgtcc gcgcggccgg acatttagta gtagt 595

```

<210> 276

<211> 1172

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (119)

<223> n equals a,t,g, or c

<400> 276

```

tactatttat agctttagat agggcctccc ttccctctct ctttctttgt tctctttcat 60
taaaccctct cccagttttt ttttttact ttaaaccctc ctctcatgg ccttggccnt 120
ttctgaagct gcttctctct ataaaaatgc ttttgccgaa acatagtttt tttttagcag 180
atccccaaat ataataaggg ggatgggtgg atatttgtgt ctgtgttctt ataatatatt 240
attattcttc cttgggttcta gaaaaataga taaatatatt tttttcagga aatagtgtgg 300
tgttttccagt ttgatgttgc tgggtgggtg agtgagtga ttttcatgtg gctgggtggg 360
tttttgccct tttctcttgc cctgttccct gtgccttctg atggggctgg aatagttgag 420
gtggatgggt ctaccctttc tgccttctgt ttgggaacca gctgggtgtt tttgggttgc 480
tttcttcagg ctctagggtc gtgctatcca atacagtaac cacatgcggc tgtttaaagt 540
taagccaatt aaaatcacat aagattaaaa attccttctc cagttgcact aaccacgttt 600
ctagaggcgt cactgtatgt agttcatggc tactgtactg acagcgagag catgtccatc 660
tgttggacag cactattcta gagaactaaa ctggcttaac gagtcacagc ctgagctgtg 720
ctgggacgac ccttgtctcc ctgggtagga ggggggggaa tgggggaggg ctgatgaggc 780
cccagctggg gcctgttgtc tgggaccctc cctctcctga gaggggaggg ctggtggctt 840
agcctgggca ggctgtgtct cctcctgacc ccagtggctg cgggtgagggg aaccaccctc 900
ccttgtctga ccagtggcca ttagctcccg tcaccactgc aaccaggggt cccagctggc 960
tgggtcctct tctgccccca gtgcccttcc ccttgggctg tgttggagtg agcacctcct 1020
ctgtaggcac ctctcacact gttgtctgtt actgattttt tttgataaaa agataataaa 1080
acctggtact ttctaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1140
aaaaagggcg gccgctcgcg atctagaact ag 1172

```

<210> 277

<211> 780

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (161)

<223> n equals a,t,g, or c

177

<220>

<221> misc feature

<222> (773)

<223> n equals a,t,g, or c

<400> 277

```

cgcggaacaag gccaggctag ccttgagctc cgtcggggcag ggcgccggga ttggtgtccg 60
gcagagcgtg agccagcggg gcgamgtcgg cgagcggggag tgaaagaaga aaagctagag 120
agcgaaggca aagccgagga gagagggccg cggtcggcga nggaatctga ctgcacgggt 180
gcgtgcgctc acttcgggag gctccctcag scgggcggtt ccgstagtgg ctaaaggcaa 240
agcattccgg ggcgcgggcg atgaagttga gcttcgtccc tgctagccgc cgttttctcc 300
ccaaaaatac atcctagcct taatgtttat gcctccattg cccagttct tatctgtttt 360
gctcaatgtc tcatagctac aagaaggcaa tttctgacga agccctccgt sccttccaaa 420
tggtattatt tggcgggcgt ycaccgggac agtatgccac ccgaatgact ggacaagtgc 480
acgggagcgg ctgtcatttg cggagtgcgc cttgcgatct aggcgcctca cagcgmaayt 540
atccagtaat ttctctgaaa tcgatgctgg tttgttttcc caaggcaaat cagcagctta 600
tacagacatt ggggccacaa agccggtgga acaacgggag acggcttctt gagtgtcagg 660
tcctccaaga tgagcttaaa mttcgggtgg tgggcaggyt cgtaggcggg aaaggscctg 720
gtccagatgr atgcaktcca tgtatatatt gatgaaagac acgtatacca ttnggtcaag 780

```

<210> 278

<211> 2375

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (9)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (920)

<223> n equals a,t,g, or c

<400> 278

```

cggcagcgna ccaagatggc ggcgccctgt gagggacaag cgtttgccgt aggggttgaag 60
agaattgggg tgcatagatt cgctccccag aaggggacccc ccagaaaatc cggcagctga 120
tagatgaggg gattgccccg gaagagggag gcgtgggacgc gaaggacacg tctgccacat 180
cccagtcagt taatggatca cccaagcgg aacaaccttc attggaatct acaagcaaaag 240
aagccttctt tagcagagtg gaaacatttt cttcttttgaa atgggcaggt aagccctttg 300
agctgtctcc actcgtctgt gcaaaatatg gctgggtcac agtggaatgt gatatgctca 360
agtgtcttag ctgtcaagct tttctctgtg ccagtttaca accagctttt gactttgaca 420
gatataagca acgatgtgct gagctgaaga aagccttgtg tactgcccac gagaagttct 480
gtttctggcc agacagccca tccccagacc gattttgggat gttgccccctg gatgagcctg 540
ctattcttgt tagtgaattc ctagatcgtt ttcaaagcct ttgtcacttg gacctccagc 600
ttccttccct aaggccggag gacttgaaaa ctatgtgctt gacagaagac aagatcagtc 660
ttctcctaca cttgcttgaa gatgaacttg atcacccaac tgatgagaga aaaactacaa 720
tcaaattagg ctcagacatc caagtccacg tctctgcttg tattctctct gtgtgtggct 780
gggcgtgtag ttcctctttg gaatccatgc agctctccct gatarcatgt tcgcaatgta 840

```

178

```

tgargaargt ggggctctgg ggcttccagc agattgaatc gtccatgact gacctggatg 900
catctttgcc tgaccagctn cccaatccca ggccttgagg ggcgaccaga gcgcttacct 960
ctggtgcctg aatctcctcg gaggatgatg acccgagacc aggatgccac tttctcccca 1020
ggctcagagc aggctgaaaa gagccctggg cccattgtct cwcgaactcg gagctgggac 1080
tcttccagtc ctgttgaccg tcctgagcca gagctgctag ccccaccacc agaactcgcc 1140
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gactttttga aaaattaagg ctgagttcct ttccggtcagc tgacactaag tttttcctgt 1620
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ttcagaagar acccctytcc atgtgccatt gaatgcatga gtcccccact tgggcttccc 2220
caagactcgt tgcttttggg ggatcatcag tttttgtggt agagaagggtg gaccctgaac 2280
tgcccactga taaagtaacc atgacctagc aaaggctaga aagtgattat tctctgatat 2340
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```

<210> 279

<211> 2461

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (14)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1164)

<223> n equals a,t,g, or c

<400> 279

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tttcaattct tggntttctg ttcccttcta caaaaaccca gcataggact cagtgtacac 60
ttacttttaa acaaaaactc acatttctta gctgcagggt atggcctcag tcattttaat 120
acagcctgga atgagtttgc ttattaccca gtcactttcg tagtgaatgt tcaaacccca 180
aagcaaagtgt ttgcatctcc ttgtccataa aggagaaagc caggttatag gagaaaagaga 240
gagaaaggcg catgtctgtt tgcacagaga gaggcaattt tgtctacctt tcgagaatca 300
gttataaaca gaagggcctc ttaggatttt gagctctcct gacaatgaag gaaaagctct 360
cttgagtata caagttccac actcattacc tttcagtggt gacctcac ccactacaat 420
ttgttgaagg aagggtgtgt cagagatatg ctttaaagtt gtactttagg ctgaaattct 480

```

179

```

ctctgtat ttt ggacctgcag atgtttgtgta cagaaccgat gcatggcagg gtcaggaagc 540
taggagagtg aaggcgcttg tggagacagc tctgtagcaa atgaaacacg gaagcctccg 600
ggaatgtgtt tgtgtcacca gcagcaggca tttccctgtc ctccccaccc ccagtctcca 660
catccccagc agcctcttcc agaagcatgt cagggagacg gacagggtgt ctccttctcg 720
tgcaccacat ccaagtccac ccaccgtgga cgcagtgtga ctaaagtctg gccttgaaga 780
gaaaccctca gccagcttgt ctgtttgtcca ggtccctcag tgtctctggg ttccctgccc 840
tgcataat ttt aagcattagt gccaaataca tctgtcatat tcctctccct ggagactgcg 900
aaatgtccag acttttttcag actagtggag ggaaggaatg ttacataact aagtggaggc 960
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ttgcttattg ttccaagaca ttgtcaataa aagcatttaa gttgaatgcg aaaaaaaaaa 2400
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaagggcggc cgctcgcat ctagaactag 2460
t 2461

```

<210> 280

<211> 2520

<212> DNA

<213> Homo sapiens

<400> 280

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accacttgca ctccagcctt gaacagagtt aggatcctgt caaaaaagaa aagaaaaaga 60
.aagcagcatt caaatgtaag acaactgtaa aatattgagc ccacttggg ctaaaattca 120
aaaagaagaa cgcctgtcca tcgccttttt ataagtcctt ctctccacac ctaaaagcag 180
ctgcagctgg aagggcacaa attccactgt gtaaaataaa atattagggg caacacactt 240
catcaaggca gcaggaatga gagagagcag agaagatcaa ggatgaagtc ttgggtactg 300
aaaaattcag tgctgggcag aaaaactgac agggcagtac aagtaacaaa cagaatccaa 360
gtgggggtggc ccttgtgcac agagctccag gtgacctctg gagagacatg ggcattcaca 420
tggaagcta aaacggaagc tcaagtttca tactcaacat aatcttctgt gtgacaaagg 480
acaagccatg tagcctctct gtgcctat tttcatgcat aaactgggac tcataatatt 540
tgtaaaatgt attgatactc tcagggcaaa ttactatat tgctatacag ttgagatcag 600

```

180

```
tgttgtaaaa ttaaactgat ctgggttctaa ttgcctcaaa ggccaaagcc caggcatttg 660
aaatggaaaag aagcagagag gaggctgact tagctgattg gtatggaaac agttggggcca 720
agagccagaa tttccctttg tagcaacacg gctagtttta ctttgagaag ctctgctcag 780
ctgctttata acattaagtc tggcggaatg gatgtcactg tgcacaataa agttttcaca 840
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tatatcgtag ggcttaacat ttcactcaaa aaaaagcccc tctttttcta atccttagtc 1740
tttgtttcaa ggaaagccag tttttcttct accacatttt ccaggatcga ctttaagaaa 1800
aatgcaacat ctattgaaaa aaagtgggggt gtatgcatgt ggtttaattc cagattgctt 1860
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tggagtgcaa tgaactgagt caatatggca aggtgtatgt gatctgtggg agttatgcca 2040
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agaagatgca gaattctgtt ggtgtgcaaa aagtatagcc ttacattcaa gcagaatgga 2160
tctgaagaaa gcagcaatat ctgttactag agaacattcc catgtgttta aactcttcac 2220
ttcttagatg catttaaaatt cttaatgcaa atgacgtagc aatttgaaaa cttctccgta 2280
ttacttgtgt ttaaaatgtc ttgctttaaa tacaaaacaa atggtaaaagg ggattatctt 2340
ttgttttagat ggttaaatat tatttttgct ttagatagct ttgtaataat ttttctccag 2400
acagttcaac acttttgaaa aatgacatga attttcatta aaaacccttt tcctatgttt 2460
attgtataca agaattatgc aataaaattt ctttataaaa ataaaaaaaa aaaaaaaaaa 2520
```

<210> 281

<211> 1448

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1427)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1432)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1440)

181

<223> n equals a,t,g, or c

<400> 281

```
cagcgccact agcctcattg tgcccaggag ttctccaaac ccgcgctgcg gaggtagtga 60
ccaagttccg gccagttcga cctcgaggat ccagaggtgg agacggtact acctcccagc 120
tctgttttcc atccccctca ggtecttccct cgggagggcgg cgaaggcggg ccaccctgcg 180
cgtgatcctt yatgcccggc cctgccccct ccttcggggt ggaacttccc cctcaccgcc 240
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ggtaaaagca gctgttaagt atgcccttag cgtaggctac cgccacattg attgtgctgc 480
tatctacggc aatgagcctg agattgggga ggccctgaag gaggacgtgg gaccaggcaa 540
ggcgggtgct cgggaggagc tgtttgtgac atccaagctg tggaacacca agcaccaccc 600
cgaggatgtg gaggctgccc tccggaagac tctggctgac ctccagctgg agtatctgga 660
cctgtacctg atgcaactgg cttatgcctt tgagcgggga gacaaccctt tccccagaa 720
tgctgatggg actatatgct acgactccac ccaactacaag gagacttggg aggtctctgga 780
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cagcttcttg gcctcccttc cagctctgca gctaattagg tcctgccaca acggaaagag 1380
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caaggga
```

<210> 282

<211> 827

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (725)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (800)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (814)

<223> n equals a,t,g, or c

<220>

<221> misc feature

182

<222> (815)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (817)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (819)
 <223> n equals a,t,g, or c

<400> 282
 gcggacgcgt gggcggacgc gtgggtccaa gggaccccaa agctccaggc cagtttgggc 60
 gtccctgtagt tgtcccccat ggaaaggaga aggaggcaga aagaagatgg aaagaaggaa 120
 acttcaatgt ctaccttagc gatttgatcc cagtggatag agccattgaa gacaccagac 180
 ctgctggatg tgcagagcag ctagtgcaca ataacctccc aaccaccagt gtcacatcatgt 240
 gctttgtgga tgaagtgtgg tccactctcc tgagatctgt tcacagtgtc atcaatcgct 300
 ctccctccaca cctcatcaag gagattctgc tggtagatga cttcagcacc aaagactatc 360
 taaaagataa tttggataaa tacatgtccc agtttccaaa agttcggatt cttcgccctca 420
 aagagagaca tggcttaata agggccaggc tggcaggagc acagaatgca acaggtgatg 480
 tgttgacatt tttagattct catgtggaat gtaacgttgg ttggttgga cctcttctgg 540
 aaagagttta ttttaagtaga aagaaagtgg cctgtccagt aatcgaagtc atcaatgata 600
 aggatatgag ttacatgaca gtggataact ttcaaagagg catctttgtg tggcccatga 660
 actttggttg gagaacaatt cctccagatg tcattgcaaa aaacagaatt aaagaaactg 720
 atacnataag gtgcctctgc atggctgggtg ggattgggtt ctattgccaa aagttacttt 780
 ttttgaactt ggaacatacn aacccttggc cttnnangnt ttggggg 827

<210> 283
 <211> 524
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (518)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (524)
 <223> n equals a,t,g, or c

<400> 283
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 gatcaggcca ttggcctcct cgtggccatc ttccacaagt actccggcag ggagggtgac 120
 aagcacaccc tgagcaagaa ggagctgaag gagctgatcc agaaggagct caccatkggc 180
 tcgaagctgc aggatgctga aattgcaagg ctgatggaag acttggaccg gaacaaggac 240
 caggaggtga acttccagga gtatgtcacc ttcctggggg ccttggcttt gatctacaat 300
 gaagccctca agggctgaaa ataaataggg aagatggaga caccctctgg gggtcctctc 360

183

```
tgagtcaaat ccagtgggtg gtaattgtac aataaatttt ttttgggtcaa atttaaaaaa 420
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 480
aaaaaacaaa aaaaaaaaaa aaaaaaaaaa aaaaaaanac aan 524
```

<210> 284

<211> 613

<212> DNA

<213> Homo sapiens

<400> 284

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cctcactaaa gggaacaaaa gctggagctc caccgcggtg gcggccgctc tagaactagt 60
ggatcccccg ggctgcagga attcggcacg agccgcaggc cagagaagc tgcgggtgca 120
cgtagaagac gccctcacct atctggacca ggtgaagatc cgctttggca gcgaccctgc 180
cacctacaac ggcttcctgg agatcatgaa ggagttcaaa agccagagca tcgatactcc 240
tggagtcatc agacgtgtct cgcagctctt ccacgagcac cctgacctca ttgttggatt 300
caacgctttt cttccccctc gatatagaat agacattccc aagaatggca agttaaacat 360
acagtcgcct ctgacaagcc aggagaattc gcacaaccac ggggacgggtg cagaggactt 420
caagcagcag gtgccgtwta aagaggacaa accccagggtg cccctggagt ccgattccgt 480
ggaattcaac aacgccatca gctatgtgaa taagattaaa acccgcttct agaccacca 540
gaaattacag gtcattcctg gagatctgca cacstwccar aargarcarc tgaacacgag 600
gggccggcca ttc 613
```

<210> 285

<211> 533

<212> DNA

<213> Homo sapiens

<400> 285

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ggcacgagsg gcgggaacac gcggggccca agatggcggc cagccggtac cggcggttttc 60
ttaagctctg tgaggaatgg ccagtggacg agaccaaacg gggccgggac ttgggcgctt 120
acctgcgaca gcgggtagca caggcctttc gggagggaga gaataccag gttgcagagc 180
ctgaggcctg tgatcagatg tacgagagct tagcgcgact ccattcaaac tactacaaac 240
acaagtacc cgcgccaga gacaccagct tcagtggcct gtcgttggaa gagtacaagc 300
tgatcctgtc cacagacacc ttggaagagc ttaaggaaat agataaaggc atgtggaaga 360
aactgcagga gaagtttgcc cccaagggtc ctgaggagga tcataaggcc tgagctcagg 420
ccttacctcg tgcacatacc taggtgtgga gtcttgtaca ttgccatcgt caataaaact 480
gccccagttt ccccttgaaa aaaaaaaaaa aaaraaaaaa gaaaaaagtc gac 533
```

<210> 286

<211> 2071

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (303)

<223> n equals a,t,g, or c

<400> 286

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caagcgga aaatgatca agcggcacga ggtggagcag cagaacattc gggaggaact 60
aaataaaa agaggaccaga aggagatgga gcatgccatg ctaatccggc acgacgagtc 120
```

184

```

cmcccgagag ctagagtaca ggcagctgca cacgttacag aagctacgca tggatctgat 180
ccgttttacag caccagacgg aactggaaaa ccagctggag tacaataaga ggcgagaaag 240
agaactgcac agaaagcatg tcatggaact tcggcaacag ccaaaaaact taaaggccat 300
ggnaatgcaa attaaaaaac agtttcagga cacttgcaaa gtacagacca aacagtataa 360
agcactcaag aatcaccagt tggaagttac tccaaagaat gagcacaaaa caatctttaa 420
gacactgaaa gatgagcaga caagaaaact tgccattttg gcagagcagt atgaacagag 480
tataaatgaa atgatggcct ctcaagcggt acggctagat gaggctcaag aagcagaatg 540
ccaggccttg aggctacagc tccagcagga aatggagctg ctcaacgcct accagagcaa 600
aatcaagatg caaacagagg cacaacatga acgtgagctc cagaagctag agcagagagt 660
gtctctgctc agagcacacc ttgagcagaa gattgaagag gagctggctg cccttcagaa 720
ggaacgcagc gagagaataa agaacctatt ggaaaggcaa gagcgagaga ttgaaacttt 780
tgacatggag agcctcagaa tgggattttg gaattttggtt acatttagatt ttcctaagga 840
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taaagattga aaatttgata cattttacag aaactaattg tgatgtacat atcagtgggtg 1440
acatattatt acttttttgg ggacgggggg tgggtggggt gaagagatct tgtgattttt 1500
aagaacctgc tggcaagagt ttaacttgct ttcagcatat tctgattgta tcataatcat 1560
tttctgctgt tgcagaggat gtgaatacac ttaaggagct cacagaatcc cagtagcaca 1620
aattgggctt tggcaaatcg tgtattttgt gtatagaagg aatttaagga gaggtattac 1680
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cagatcatct tgatcttttt ctttatctcc cttccccttc ctaagtccca tttcttggtc 1860
ataaatattg cattattcac actttcaaac tgtgtatttt cttacaataa aaaatgatga 1920
aaaaaaaaaa ggctttactt cttttgcatg cactttaaaa acaaaaacaaa acatttttca 1980
ggttccaagg aaragcatga taactgtcag agcttttaat tatatttgta aataaaagtg 2040
ttcatcacia aaaaaaaaaa aaaaaaaaaa a
2071

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<210> 287

<211> 1966

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (56)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (788)

<223> n equals a,t,g, or c

<220>

<221> misc feature

185

<222> (1753)

<223> n equals a,t,g, or c

<400> 287

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gaactagtct cgagtttttt ctgtctagct ccgaccggct gaggcggcgc ggcagnngag 60
ggacggcagt ctgcrcggc tactgcagca ctgggggtgtc agttgttggc ccgaccacaga 120
acgcttcagt tctgctctgc aaggatatat aataactgat tgggtgtgcc gttaaataaa 180
agaatatgga aactgaacag ccagaagaaa ccttccttaa cactgaaacc aatggtgaat 240
ttggtaaacg ccctgcagaa gatatggaag aggaacaagc atttaaaaga tctagaaaca 300
ctgatgagat ggttgaatta cgcattctgc ttcagagcaa gaatgctggg gcagtgattg 360
gaaaaggagg caagaatatt aaggctctcc gtacagacta caatgccagt gtttcagtcc 420
cagacagcag tggccccgag cgcataattga gtatcagtgc tgatattgaa acaattggag 480
aaattctgaa gaaaatcatc cctaccttgg aagagggcct gcagttgcca tcacccactg 540
caaccagcca gctcccgcct gaatctgatg ctgtggaatg cttaaattac caacactata 600
aaggaagtga ctttgactgc gagttgaggc tggtgattca tcagagtcta gcaggaggaa 660
ttattggggg caaagggtgct aaaatcaaag aacttcgaga gaacactcaa accaccatca 720
agcttttcca ggaatgctgt cctcattcca ctgacagagt tgttcttatt ggaggaaaac 780
ccgatagngt tgtagagtgc ataaagatca tccttgatct tatatctgag tctcccatca 840
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cttcgatcaa aattgatgag cttttagaag gatccgaaga tcggatcatt accattacag 1500
gaacacagga ccagatacag aatgcacagt atttgctgca gaacagtgtg agcagtwma 1560
gwtttagcttt gtgttagctt atacatacta aaacctttta aaagcttttc ttctcaattg 1620
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ctaatagttt gccttaattt ttcttctgct ttcttactaa aaacgargac attcaatact 1740
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gctgccaaaa ccacttgta aaaattgtac agagcctgta ggaaaatata gaaggttcca 1860
ttgggatgtt ggcctagtcc tgtgtgggaa gacttagtgg attttgtttg tttttagata 1920
actaaatcgg ccaacaaatc accgttctgg cctatgggac cgggcc 1966

```

<210> 288

<211> 869

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (869)

<223> n equals a,t,g, or c

<400> 288

```

gctctggcgg gcataccagc gggccctggc cgctcacccg tggaaagtac aggttyctgac 60
agctgggccc tgtggttagga ggctggtaca aggttttggg tcggttcac cctggcacca 120

```

186

```

ccaaagtgga tgcactgaag aagatgttgt tggatcaggg gggctttgcc cegtgttttc 180
taggctgctt tctcccactg gtaggggcac ttaatggact gtcagcccag gacaactggc 240
caaactacag cgggattatc ctgatgcctt taccaccaac tactatctat ggctgctgt 300
gcakttagcc aacttctacc tgggtccctt tcattacagg ttggccgttg tccaatgtgt 360
tgctgttate tggaaactct acctgtcctg gaaggcacat cggctctaag cctgcctcac 420
tccatcgttt ccaccttgca gtgatgcagc ttgacctggg aacggtcaga caacctcttc 480
aaagtgggca taccagtttc cacgggggtg ggttgccggg cagagcttaa gaggactagc 540
acctgcaat gccctcttc actctaaaat gtacactgac tgcttttagag cccttgataa 600
tagtcttatt cccaccacat actaggcaact ccataaatat ctggtgaacc ttcattgacct 660
tatcaacttt acaccatata cccagcaaat gccactcacc cccactcttc atagacacat 720
ttgttactct aacctgcctt aggtctcttg tagctccagc tcttttagaga ctcccggaac 780
ccttttatatg gtgcctcagt aaatatgtta ttaatatgtt aatccggaaa aaaaaaaaaa 840
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 869

```

<210> 289

<211> 1105

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (34)

<223> n equals a,t,g, or c

<400> 289

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cagaatgtat tcggcagaaa agggactcag gtangcccag cctgggactg agagcagaaa 60
agcattcaag atttgcaggc cttgctatgg atgcgcttaa tcaccatgga ggccagcaat 120
acctatctca gcatggcttt gatattctct acctcctggc ctttaaaaaat gacctataat 180
ttttcagttt gctttactat attttataaa gaaaattcta tcttatgggt gattgagcat 240
tgagacttat gaaggcatta ggatagatag ctcaggaatg taaaggttca gaaaaggctt 300
gttttctcag attaacaaat atgatggatt ccattggctga ccttgggtgct taaaccagga 360
ggtttcaatc tagtcctaga gttgtgtccc tctgaaaggc ccaatgccat gtaactaact 420
ttaaactgga tatatacttt gagccttact taattcacag ataagttgac ttaactcagt 480
atttttatct caattaatga aaacagtcct cttttcaacc ccaggttgct tacattttgc 540
tgggtctcccc aagtgaccat tgggtggagac caattaatga aggaatgaaa ttcactttat 600
tgggactgtg gtattcaaca gagccacact taaccacttt ttccaatgaa gaatctccag 660
aatgataatg cccaaatatg gatggccaar aagaatttgt atctacgggt tgcttttatgt 720
gtttttgaca ctgctgtatt ctgtgtgata aagtgatttg sagctgggtt caatgtkact 780
gagtgttctc aaaratttct agtaactaag tcaacttaat tttcttaagc ctgggtattac 840
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cgaggggttg gatgagagcc tacttcctac ctcttaaggc actttcctca ttattttgcc 960
atataatctt gaactgcatg ataagctgtt taaatgtcca tgacttctcc cagagcaact 1020
agcaaagtat atgaccattt tgaatagagg ttagtggaag ggaaaatgta gaggttttaa 1080
gttccagagg tacaaacctc caata 1105

```

<210> 290

<211> 1982

<212> DNA

<213> Homo sapiens

<400> 290

187

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tggatccccc gggctgcagg aattcggcac gagcagagac gtggaggcgt gagggagaac 60
atgcttggtta aatatgcagg tagattagga gacaccaaac agagattcag acacagtaag 120
gctgggatga gatcctcgaa gctgtgtttt aacaaactcc actggagagt cccatattcc 180
ctcaaatttg ggaatcacga ccctgaacca ggttgggcct gaagcagtca actgaattca 240
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ctggcactct gccttgaacg taggaagctc ttgatgattt gtggaatgaa tttttaaaaa 360
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atttgatatt ttagtatattt ggtgtaaaag ccaacaggca aactttgccg ggtactgtgt 480
agaaactcga aaatgtgagg ccagtttgta cagttcagag gaaatgcttt aacgtagaat 540
cagatagctg gaagagatct tcgagggaaa gtaagttccc taaagtcaca tctatgtctc 600
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ttcaaatgaa atctattgat ttctagtaat catatktgaa tcaatgttaa agcatatata 780
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tataccaaaa atactttgtt aatttaatgt gttggcttcc caactcctga acacgacaca 1320
atttttattat tagattttgt atggtgattt taggctatga aaacatgac attatatgta 1380
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aagtattctg attctggtta aattaacgaa tatggttcca ggccctgttc tctgggtttt 1620
tgagagagaa taaaggttat gtttgtctta cttttgttat cgagtttgtc gaattctttt 1680
gaacgatgat cttaaaggca caaacaccac cagccacttt gctaattttc taatagcaga 1740
tttacattgc agcaagaaaa ccatctttta tagtaacatt cagttaaaaa gaactcaatt 1800
cattgttaac ttccataaac agaatttgaa ctttatcaac ctcaacgtgt atataaaacta 1860
gatagtcttc aatactttat caacctcaac atgtatataa actagatagt cctcaaatac 1920
tgtttgaatt taataaatgt caatttaaaa atttttaaaaa aaaaaaaaaa aaaaaaaaaa 1980
aa 1982

```

<210> 291

<211> 2329

<212> DNA

<213> Homo sapiens

<400> 291

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tttttttact ctagggaaaa cactgacgaa tggtcagagc tcctatcctg atcttttcat 60
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agaaaaagaa aactctggcg ttagaggata tagaaaaata taagtacaat tgttacaaat 180
aacgcagact tcaaaaacaa aaaaatcaca acccaaacaa accaaaattt aaatgatcag 240
aattggcagc acaaaagaaa cgccctctcc tgacttgtat tgtggcagtc tgaacgcccc 300
cagaaaattg tgccaaagag tttagaaaaa taaatataca ataaaagtaa acacatacac 360
acaaaacagc aaacttcagg taactatttt ggattgcaaa caggataatt aaatgttcaa 420
acaatctgat aaaataacca tttggaaact gcttggcctt ctgttctttt atttgattga 480
ctacaatgcg gtattggtct cttgctgcac ttcaaaagca accaacaaaa caaaaacaaa 540
aaaaagtgtg tgtgtgtgaa tacacacaca cactaactag aagtcttgtg atgaaaatgg 600

```

188

```

cacttggaag agggttttatt tttccactga agttgaaggt taataaaatg gtgtcaaacg 660
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<210> 292

<211> 2424

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (666)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1757)

<223> n equals a,t,g, or c

<400> 292

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gagcttcggg cgcagaattc ttcaccttct cttccccctt ccatctcctt tccccgcgga 180
aacaacgctt cccttctggg gtgtctgttg atctgtgttt tcatttacat ctctcttaga 240
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189

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gacgtgcagg tgaaggacag gaaggggcat gtgagcgtaa atagaggtga ccagaggaga 360
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tccccatggg ggtgggaggg cccccagctg gaagagcaga ctcccagctg ctacccccctc 480
ccttcccatg ggagtggtct tccatttttg gcagaatgct gactagtaga ctaacataaa 540
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aaaaaaaaa aaaaaaaagt cgac 2424

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<210> 293

<211> 2160

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (470)

<223> n equals a,t,g, or c

<400> 293

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tttgaaagca ctgcaaataa gaaatcctcc tcctcttcct caggaacccc tgcacatcag 120
ctttatccac agtctcgggg gctggttcca aagtaaagcc agcttctcct ctcccagggc 180

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190

```

ggaaacagca tttgccttct gagagaagag actagcaaaa agctgcagag aggattcggc 240
ccaaactcag aactgttccc ctgaggagaa gcggtggcct ctttgcagat caaccaactt 300
aatctggttg aacgtgctgt tcctaactctg gcactcagcc cctctgggaa acatctttta 360
attagcatct cagaaatgca tgggtaaggt aaagtgcgat agttcaagtg gaaagcaaga 420
gaatgaccag tgaccttgct tccttcccc ttgccttctt ccccccttn ccctgtgctc 480
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aagaacaaaa cgctaagggtg ggtagcctaa gctgattttc tgctgggttac acgtgtctct 2100
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<210> 294

<211> 1257

<212> DNA

<213> Homo sapiens

<400> 294

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tcgaatgtca tcaggaatga gcagctgccc ctgcagtact tggccgatgt ggacacctct 60
gatgagggaaa gcatccgggc tcacgtgatg gcctcccacc attccaagcg gagaggccgg 120
gcgtcttctg agagtcagggt tctaggtgct grakycgca cgraggccga tgtagaggag 180
gaggccctga ggaggaagct ggaggagctg accagcaacg tcagtgaacca ggagacytcg 240
tccgaggagg aggagtccaa ggacgaaaag gcagagccca acagggacaa atcagttggg 300
cctctcccc aggcggaccc ggaggtggca cggctgccc tcaaaccaac agacaggaaa 360
aaagccccc ggaccctggg gaccccgctc agtacaacag gaccacagat gaggagctgt 420
cagagctgga ggacagagtg gcagtgcagg cctcagaagt ccagcaggca gagagcgagg 480
tttcagacat tgaatccagg attkcagccc tgagggccgc aggctcacgg tgaagccctc 540
gggaaagccc cggagggaagt caaacctccc gatatttctc cctcgagtgg ctgggaaact 600
tggcaagaga ccagaggacc caaatgcaga cccttcaagt gaggccaagg caatggctgt 660

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191

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gccctatctt ctgagaagaa agttcagtaa ttccctgaaa agtcaaggta aagatgatga 720
ttctttttgat cggaaatcag tgtaccgagg ctctgtgaca cagagaaacc ccaacgcgag 780
gaaaggaatg gccagccaca ccttcgcgaa acctgtggtg gccaccagt cctaacggga 840
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gacctttata ctgtgatctt ttaccccttt cactcttggc tttcttatgt tgctttcatg 1200
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```

<210> 295

<211> 1117

<212> DNA

<213> Homo sapiens

<400> 295

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aagctcacca ctgctcagga ggtgctggcc cgggcccgcga acctgatttc acccaggatg 180
gagaaggcct tgagtcaatt ggccctgcgy tctgctgcgc ccagcagccc cgggtctccc 240
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<210> 296

<211> 468

<212> DNA

<213> Homo sapiens

<400> 296

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agtggggacc aggggtgtccc ctgctgagaa atggagagct cttttccctc gtacttctct 120
ggggtttgcc ttgtggaacc aagtgtcttg gggaggagct cctggcagga ctccagctgt 180
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ctatgtgtaa ctcttctcca tctccaagca gacaaccttt gtctttacat gcaagaggga 300
tccaattatg acaggctgac ccagctggtt tcatgtttgg ggtttatcta ctgagtaagg 360
ctgaccttac ctgagtttct gtatgtgtat ttgcaagaca gttaatacta atccatcatc 420
cctcacagag atgtagagga tgagatgtag taacttatag cagtgtca 468

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192

<210> 297
 <211> 464
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (80)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (458)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (461)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (464)
 <223> n equals a,t,g, or c

<400> 297
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 tatagtcttt gggccccttn ctccagtatcc tgggaaccct gggccaggag gttacagtgg 120
 tcatcataat tgctgaagag atccccctcc ctgcccctgg gttcctgcct tccctcctca 180
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 tgctctcagg cctcaaacc tttcatacct ttattctttt ttttaaccaa aaaagttttt 300
 cttataaaat aaatttttggg caaacawmaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 360
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 420
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aggggggncc nttt 464

<210> 298
 <211> 2630
 <212> DNA
 <213> Homo sapiens

<400> 298
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193

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tgaatatgcc aaagacaata aagagcagtt catggagaat cacaatccca tcaattccgc 600
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<210> 299

<211> 1422

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (13)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (16)

<223> n equals a,t,g, or c

194

<220>
 <221> misc feature
 <222> (1205)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1367)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1381)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1398)
 <223> n equals a,t,g, or c

<220>
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 <222> (1401)
 <223> n equals a,t,g, or c

<400> 299
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 tggatatttt gtctaacc aaagaagtct caagaaatca ggcagtgcag ctgctgctct 180
 cagctatcgt atccagccaa aagatgcatg atgatggagt ggtgggggaa ggccagttca 240
 gtatcctatt taaaagtaaa ctctcctgaat aatggatata tgtggagata cagacataga 300
 tatatagata cagctgtaat tatttagcct caagtgcatt tctccattgc ttcacgctat 360
 gccactatct tgcttcttta attttttttaa ccttgcttag tattctatag tttgcccac 420
 cagtttttacg tccaaggaaa attagccaat gcataaaaata taaaactat gaaaggcaag 480
 gwtcaggaaa ccagagactt tgccaccaa tctcagatta ttagaaacta ggtgtcaggg 540
 tttatcaaga aggccaggaa ggccttttgg gttaagcctt acattcatga agaacctcga 600
 gggtagatct ttgagagcat tccaaatgaa tggctctctg tcaaatgaat gaatgggtcaa 660
 atgaataaat ctgccctcac agagatacaa aaggaaaagg aatataattc ataccatttg 720
 gtttaagcct tacattcatg aagaacctca agggtagatt tttgagatca ttccaaatga 780
 agtcgaatct gccctcacag agacacaaga aagggaatata attcatacac tattgcattt 840
 ttaataaatc ttttgaaatt tgcagaatta gattgtattg tgtattttcg gttaaatgat 900
 aattgaatgt aaatatttag atgcagcacc atattttata acccagcttt agcattttctt 960
 catattttta ggaaaccccc cacctccttc ttttaagggc gcttcttgct ctctgaaatg 1020
 ccctgctaaa tgcttctctt aattatttga ataaggtagt ttggaataaa gaaagaaaaag 1080
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 atmcaagata gtttttagaaa gactcaaaac aatatgtaaa tgactgatgt ttgcattatt 1200
 aaggnaaract tgggatgttg ggtcaagagg ggaaagtgtt agtcaatcca ctttggagca 1260
 atatcatgaa ggtcaattat aattccatat acctttcttt gatgccacag tcagagatag 1320
 atacagttgg gtggccatgg gtgtgcccac acagacaatt tttggtnaat tgtttcagac 1380
 ntccaggtct gagactgnca ntgctggggg gcctcctggg tt 1422

195

<210> 300
<211> 553
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (484)
<223> n equals a,t,g, or c

<400> 300
gcccacgcgt cccgatggttt cttctattca ggcttcaatg gacaggcacc ttcgggatca 60
aagtacagag cagtcacccat ctgatcttcc tcaaaggara acagaagttg tgagttcttc 120
tgcaaaagtct gggagtcttc agactgggtt gcctgaatct tttcctttaa ctgggtggtac 180
tgaaaaatttg aatacagaaa caactgatgg ctgtgtagca gatgcactgg gagcagcctt 240
tgccacaagg tcaaaagcac aaaggggaaa ttccgtggag gagcttgaag agatggatag 300
tcaagatgct gagatgacta acacaactga gccaatggat cactcttgat ttaattagag 360
gctaataaag gcagaatgtt tattgtgaat atgtaatat tggtggctgg gccacgtaac 420
ttgattagtc attaaaaatc ttgtacgtat ataaaaagat tataatcttgat tattcagtcg 480
atgntagcaa gtgtgtgatt ggccatagct tttaatatac tgctgcccag gctggctctg 540
aatctctata aat 553

<210> 301
<211> 464
<212> DNA
<213> Homo sapiens

<400> 301
ctcaaaaaatc accagaaaaac tcatactagt gaaaaatcct ataaatgtaa tgaatgtaga 60
aaggccttcta gttactgctc tgggtcttatt caatgtcagg tcattcatac tatagaaaaa 120
ccttatgaat acggtaaatg tggcaaaagcc tttaggcaga ggacagacct taaaaaacat 180
cagaaaaatgc ataccgarga gaaaccctat gaatgtaatg aatgtgggaa agcctttagc 240
cagagcacat atcttacaaa acaccaaaaa attcatagtg aagagaaatc aaatatacat 300
actgagtgtg gggaaaccwt twgrcaaaac tcttcttttt tacaacaata aaaacctcac 360
actggagaga ttctctgaat gccttaagaa tttggttaat atggagaccc ttcccagggg 420
aaccagaagg aggatcgtga aaacctgttg actacttaga tgat 464

<210> 302
<211> 2018
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1997)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2012)
<223> n equals a,t,g, or c

196

<400> 302

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gccacatccc ggcagccctc ctaccckgcgc acgtggtgcc gccgctgctg cctcccgcctc 60
gccctgaacc cagtgcctgc agccatggct cccggccagc tcgccttatt tagtgtctct 120
gacaaaaccg gccttggtga atttgcaaga aacctgaccg ctcttggttt gaatctggctc 180
gcttccggag ggactgcaaa agctctcagg gatgctggctc tggcagtcag agatgtctct 240
gagttgacgg gatttcctga aatggtgggg ggacgtgtga aaactttgca tcctgcagtc 300
catgctggaa tcctagctcg taatattcca gaagataatg ctgacatggc cagacttgat 360
ttcaatctta taagagttgt tgcttgcaat ctctatccct ttgtaaagac agtggcttct 420
ccaggtgtaa stgttgagga ggctgtggag caaattgaca ttggtggagt aaccttactg 480
agagctgcag ccaaaaacca cgctcgagtg acagtgggtg gtgaaccaga ggactatgtg 540
gtggtgtcca cggagatgca gagctccgag agtaaggaca cctccttgga gactagacgc 600
cagttagcct tgaaggcatt cactcatacg gcacaatatg atgaagcaat ttcagattat 660
ttcaggaaac agtacagcaa aggcgtatct cagatgccct tgagatatgg aatgaaccca 720
catcagaccc ctgcccagct gtacacactg cagcccaagc tccccatcac agttctaaat 780
ggagcccctg gatttataaa cttgtgcgat gctttgaacg cctggcagct ggtgaaggaa 840
ctcaaggagg ctttaggtat tccagccgct gcctctttca aacatgtcag cccagcaggt 900
gctgctgttg gaattccact cagtgaagat gaggccaaag tctgcatggg ttatgatctc 960
tataaaaccc tcacacccat ctcagcggca tatgcaagag caagaggggc tgataggatg 1020
tcttcatttg gtgattttgt tgcattgtcc gatgtttgtg atgtaccaac tgcaaaaatt 1080
atttccagag aagtatctga tgggtataatt gccccaggat atgaagaaga agccttgaca 1140
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tctgccctcc gagacctcat cgtagccacc attgctgtca agtacactca gtctaactct 1380
gtgtgctacg ccaagaacgg gcaggttatc ggcatggag caggacagca gtctcgtata 1440
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gtgctttcga tgaagtttaa aacaggagtg aagagagcag aaatctccaa tgccatcgat 1560
caatatgtga ctggaaccat tggcgaggat gaagatttga taaagtggaa ggcactgttt 1620
gaggaagtcc ctgagttact cactgaggca gagaagaagg aatgggttga gaaactgact 1680
gaagtttcta tcagctctga tgccttcttc cttttccgag ataacgtaga cagagctaaa 1740
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aggcctgcga cgaactggga atcatcctcg ctcatacgaa cttcggctct tccaccactg 1860
attttaccac acactgtttt ttggcttgct tatgtgtagg tgaacagtca cgcctgaaac 1920
tttgaggata acttttttaa aaaataaaac agtatctctt aatcactgga aaaaaaaaaa 1980
aaaaaaaaaa aaaaccncgg ggggggcccc gnacccca 2018

```

<210> 303

<211> 658

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (621)

<223> n equals a,t,g, or c

<400> 303

```

gacatttagg aacaattgca cttttaaagg gagagaatgc atagttgctc acatatctca 60
gtgtcagtc cctaacatgg atcagtgctt tattttgagat tacaaaacta gaaaatgacg 120
gagtcaaggc taggaccaat attctgttca gtcttagata attatagaat acacattaaa 180

```

197

```

atcagatatt tgaattttct taattttgta actattttgtc attgaaagga gatactaaaa 240
aaattatata tcgtcctaga aagtacatga actaataatg cattttctaaa ggtgaaaaaa 300
gaataggtat ttttctggtt aatattcaat ttatagagag tagtacgtta atttttttta 360
accccgagaag ctcaggatct tatcatttta aaagaaatta tcaccagttc tgtgtgagta 420
aataaagtat tataacactt tgttttttca tccatgatac cttgtattta cttacctgag 480
ctttttttct agggaaagaa aaatgctcag gtaataacag agccttgaaa aattkggatt 540
ttcaaaacta cctatttatg tataggcctt tagatcatct gatgttgaat actctttaag 600
tgatctaaag gcctacatat naaaaggtat ttttattaaa ttctggatta aacatttc 658

```

<210> 304

<211> 671

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (524)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (593)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (657)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (659)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (671)

<223> n equals a,t,g, or c

<400> 304

```

tttacttaat cttgcctagt cacaaaataa gatgtgcacc catggtttgg agagttccta 60
tattagctga gcagtgagat acactatttc caaacggtgc acacctacag tagctttgga 120
aatgagccaa tcactgtttt acttaatggt tcttatcagc atgcaaatat tgcttgaaag 180
ttatttcctt attcactggt ttgttagtcc attttggttag gaaacattaa ttcctaaaaa 240
tttgttcaga ataattaaaa gtgaacattt ggtgctgata ctcaaaaacc tacaaatgta 300
gccatttaaa aagtaacatg tttttctccc ctgctcattg cctgggagaa tggaaatttta 360
tataactacc tttcttttgca aaaataacgg tcgtgtcgag ttggtggtga ttttggcatt 420
ccatcttgca ctgggtttcta gtataggctt agaaataatt ggcaggtaat aatctttcca 480
gtcaagttgc aagggatgct tatttctctt caaaaaaaga catnctgcgg gattgagtag 540
aaaatttagg tcagtttggg agcttatttg aatattttct actacattgg agntagcagt 600
ctttttctgg atcagatcag tgcatgggtt tctacagggt gaatgcttct tgggtgngna 660

```

198

agatctagct n

671

<210> 305

<211> 1680

<212> DNA

<213> Homo sapiens

<400> 305

```

ccaaagtgct ggaattccag gcatgagcca ctgcgccag tctacacact aattcttgtt 60
agcccaacag ctgttctgtt ctatctaccc ctcatctcac gctcaaggag tcatacctag 120
aatagttaca cacaagaggg aaactggaag ccaaactctg tacagtattg tgtagaaagt 180
cacctcccta ctcccttttat ttacatgag tgctgatgtg ttttggcaga tgagctttca 240
gctgaggcct gatggaaatt gagataacct gcaaagacat aacagtattt atgagttata 300
tcttagttct tgaaattgtg gaatgcatga ttgacaatat atttttaatt tttatTTTTT 360
caagtaatac cagtactgtt taactatagc cagaactggc taaaatTTTT atattttcag 420
agttgaagtt ggtgaagaca ttcatgattt aaacaccaga tcctgaaagg ggttaaactt 480
actttgaaat gaatctgcaa tcagtatttc aaagcttttc tggtaatttt agtgatctta 540
tttgattaga ctttttcaga agtactaaat aaggaatttt aacagggttt tattaatgca 600
cagataaata gaagtacagt gaggtctata gccattttat taaaatagct taaaagtttg 660
taaaaaaatg aatctttgtt attacttaat atgttagtta agaaccctgc aagcttata 720
ttgctagact tacaaaattat tttaaatgca tttatctttt ttgacactat tcagtggaat 780
gtgtaagcta gctaattctt gttttctgat ttaaagcact tttaaatctt atcctgcccc 840
ctaaaaacaa aagggttttg tacaagggg aaatttaaga ttgttaaccc tgtttttcag 900
aagggtctact gttaattgca cataaacatg aaatgtgttt tcccctgtgt actaacacat 960
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acaatgaata ggtatggtgg tttcacagaa ttttaaaata gagttaaagg gaagtgatgt 1200
acatttcggg ggcattaggg tagggagatg aatcaaaaaa tacccttagt aatgctttat 1260
attttaatac tgcaaaagct ttacaaatgg aaaccatgca attacctgcc ttagttcttt 1320
tgtcataaaa acaatcactt gggttggtgt attgtagcta ttacttatac agcaacattt 1380
cttcaattag cagtctagac attttataaa cagaaatctt ggaccaattg ataataattt 1440
tgactgtatt aatattttag tgctataaaa tactatgtga atctcttaaa aatctgacat 1500
tttacagtct gtattagaca tactgttttt ataatgtttt acttctgcct taagatttag 1560
gttttttaaa tgtatttttg ccctgaatta agtggttaatt tgatggaaac tctgctttta 1620
aatcatcat ttactgggtt ctaataaatt aaaaattaaa cttgaaaaaa aaaaaaacga 1680

```

<210> 306

<211> 782

<212> DNA

<213> Homo sapiens

<400> 306

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gaattcggca cgagtgaagc attagaatga ttccaacact gctcttctgc accatgagac 60
caaccaggga caagatccca tcccatcaca tcagcctacc tccctcctgg ctgctggcca 120
ggatgtcgcc agcattacct tccactgcct ttctccctgg gaagcagcac agctgagact 180
gggcaccagg ccacctctgt tgggaccac aggaaagagt gtggcagcaa ctgcctggct 240
gacctttcta tcttctctag gctcaggtag tgctcctcca tgcccatggc tgggccgtgg 300
ggagaagaag ctctcatagc ccttccact ccctctggtt tataggactt cactccctag 360
ccaacaggag aggaggcctc ctggggtttc ccaggggcag taggtcaaac gacctcatca 420
cagtcttcct tcctcttcaa gcgtttcatg ttgaacacag ctctctccrc tcccttgtga 480

```

199

```

ttttctgaggg tcaccactgc cagcctcagg caacatagag agcctcctgt tctttctatg 540
cttgggtctga ctgagcctaa agttgagaaa atgggtggcc aaggccagtg ccagtgtctt 600
ggggccctt tggtctctcc tcaactctctg aggtccagc tggctcctggg acatgcagcc 660
aggactgtga gtctgggcas gtccaaggcc tgcaccttca agaagtggaa taaatgtggc 720
ctttgtcttct gttaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 780
aa 782

```

```

<210> 307
<211> 1791
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (487)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (515)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (1769)
<223> n equals a,t,g, or c

```

```

<400> 307
ggggattgtt cctgaaacat tcacgctgtc caatctccca catttcagaa ttgggtgggag 60
tgtgcatattg attgttaata accagctggg ttacaccact ccagctgaaa gaggaagggtc 120
ttctttatac tgcagtgata ttgggaagct tgtgggctgt gccatcatcc atgtcaatgg 180
agacagccca gaggaagtgg tccgtgccac acgactggct tttgaatacc aacgccagtt 240
ccgcaaggat gtgattattg atctgtttgt ctacaggcag tggggccaca atgagctgga 300
tgagccattc tacaccaacc ccatcatgta caaaatcatc agagctcgaa agagcattcc 360
agacacatat gcagagcacc tcattgctgg cggactcatg acgcaggagg aggtgtctga 420
aataaaatcc tcctactatg ccaagttgaa tgatcactta aataacatgg ccctactacag 480
gcccccntgc cctgaacctg caggcccayt ggcangggcc tgggtcagcc agaagsgcaa 540
wtcaccacct ggagtacagg tgtgcccctc gacctcctgc gggtttgttg catgragtyt 600
ktagagggtgc caagrgagyt gcagwtgcac agtcamctgy tgragacaca tgttcagtcc 660
agaatggaga agatgatgga cggaatcaag ctgactggg ccaccgcgga actcttgctt 720
tgggttcttt acttgctcaa gggttttaag ttctgtctaa tggccaagat gttggctctg 780
gaactttcag tcagaggcat gcaatgggtg tttgccagga gacggatgac acctacatcc 840
ccctgaacca tatggacca aatcagaagg gggtttctaga ggtcagcaac agccccctgt 900
cagaagaggg cgtcctggga ttcgaatatg ggatgagcat tgagagccca aagttactgc 960
ccctgtggga ggcacagttt ggcgatttct tcaatggtgc ccagatcatc tttgacacat 1020
tcatctctgg aggagaggcc aagtggctcc tacaaagcgg cattgtcatc ctcttccac 1080
atggctacga tggggctggg ccagaccact catcctgtcg aatagagcgt ttctgcaga 1140
tgtgtgacag tgcggaagag ggggtggacg gagacactgt gaacatgttt gtggtcacc 1200
caacaactcc tgcacagtat ttccacttgc ttaggagaca gatgggtccg aacttcagaa 1260
aaccactcat tgttgcttcc cctaagatgt tactcargct cccggcagcc gtgtcaactc 1320
ttcaagaaat ggcaccagga acaacattta acccggtcat tgggtgattca tctgtggatc 1380

```

200

```
caaaaaaggt taagaccctc gktttctgct cgggcaaaca tttctactcc ctggtgaaca 1440
aagagaatct ctggggggcca agaagcatga ctttgccatc atccgagtag aggaactctg 1500
ccccctcccg ttggattctt tacagcaaga gatgagcarr taaaaacatg ttaaagatca 1560
tatttggagt caggaggaac ctcagaacat gggtcctggt tcgtttgttt ctccaagggt 1620
tgaaaagcag ctggcctgca agctcctgtc ggtggccggc cccctttgcc agtaccctgt 1680
gtaggaattg gcacagttca cttgcaccag catgaagata tcttcgcca gaccttcgyt 1740
tgatgatgat tttgaaggaa catatttcnt ttaggaatgg cattaggccc t 1791
```

<210> 308

<211> 723

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (705)

<223> n equals a,t,g, or c

<400> 308

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gggcaagacc tcatgcctaa aaaataaaga gaaagcagag taaaactgga ctctgagata 60
ygactaaagt tctgtgtgat acgtgtgect tatttagctc aagacattcc tggagcacct 120
ataaaaaactg acttgtaatc caggctatgt ctcttttttag cttcgtaatc tttggcaagg 180
ccattggatt cttcagctgt acaattagga gactcgatca ggtgattgcc tttctcagct 240
gtcagttctc taatttcagg cttggtagct ttaggaact gaaattgcaa ttaaacctt 300
tataaactca aactaaatca tgaattacag aaaaagtcca ttcttccaaa acttgatgtt 360
accacactta caagttttaa atatgaagtc gactgtttta aggattctgc atatattcta 420
gtgtgcacat tcagaaacat ttttcttgga aaaagtaccc aacatTTTTT ataactgcac 480
atattaattt attgccagaa taaattgcat tgcattgctaa ataaagtcag ataattcaaa 540
tccatttgct tttatgtagt ttttcttcta aatgtcaaca ttttggaatt aaaatgttta 600
tggttttata tgagggtagg aaatcttaac tgctttgggg ggtattgttt ataggctttt 660
tgttatgggg ccggtagttt tttaataggg ggattgcccc tttcnaccgt ttggggggccc 720
ggg 723
```

<210> 309

<211> 533

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (393)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (396)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (463)

201

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (527)

<223> n equals a,t,g, or c

<400> 309

```
aattcggcac gagcgacgtg gtgctgggcg ttgggaccct accttatcta gttcgggaag 60
ttgggtttgtg gggcatatac tgtctgtctg ctcccagctt tcttgggttt cttccgacgg 120
cgtggggcct cgctaaggaa ttcccggccc ctccaggcca cggctttagc ggtgtctttt 180
gcgagtctct cgtaagtaca tcttaaagct gtcaagatgg ttctagcaga ctttggaaga 240
aaaataacat cagcattacg ctcgttgagc aatgccacca ttatcaatga agaggtatgt 300
aaaatattgt atgraatata tatgattgta ttattgtcac tagcattggg aagatggctt 360
attcdataatc cccgtattta tatgtatttt gangtngact taatacttgt gggtaaaagc 420
ccaaaggggt taacagtagg aggggtttat tggggaatta ccnccaactc aaattacttc 480
aaccttcctt aagggatttc ccaaaaaaaaa aaaaaaccgg ggggggnccc cga 533
```

<210> 310

<211> 763

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (317)

<223> n equals a,t,g, or c

<400> 310

```
gttttgaata aagaaagaaa agtttactat ctgtatgtag agtgatctta atttgtgatc 60
ctatatatga gacagtataa aaatacagat aagttttaga aagactcaaa acaatatgta 120
aatgactgat gtttgcatta ttaaggaaaa cttgggatgt tgggtcaaga ggggaaagtg 180
ttagtcaatc cactttggag caatatcatg aagggtcaatt ataattccat atacctttct 240
ttgatgccac agtcrgagat asaatacart ttgggtggcc atggatgtgc cccaatacag 300
tacacatttt tkggttnaaa tttgttttca gatcatttca tggaatcttt gaagtatctt 360
tgactctaac tttgacttgg tgggtggacct tccttgggtt ttataacacc taagagatat 420
cctttagaat tacatgtatt ttagcataag gaaattgaaa aagtaaaaca tactgggttt 480
tttcaacaag accatatgta aattaaatag tgaaatgtgt atgagtttca gtagaactgt 540
accatcaaca atgtttccat aaatatgcag agttctttct tttgtattgt tattttacaat 600
attgttaaas tgaatgcatt tgcaatttct aggattctaa agaattgagt acagaaagta 660
gcaattttat tattttgatga taatatgaga attactgtgc caatactgtt ttgataaata 720
aatagatttt taaaaataaa tgtattgtac ttattagtgt agt 763
```

<210> 311

<211> 3131

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (4)

202

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (5)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (10)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (26)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3128)

<223> n equals a,t,g, or c

<400> 311

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cagcgccgga gccgggagct agcgggccgc gccatgtccc accagaccgg catccaagca 180
agtgaagatg ttaaagagat ctttgccaga gccagaaatg gaaagtacag acttctgaaa 240
atatctattg aaaatgagca acttgtgatt ggatcatata gtcagccttc agattcctgg 300
gataaggatt atgattcctt tgttttacct ctggtggagg acaacaacc atgctatata 360
ttattcaggt tagattctca gaatgccag ggatatgaat ggatattcat tgcattgtct 420
ccagatcatt ctcatgttcg tcaaaaaatg ttgtatgcag caacaagagc aactctgaag 480
aaggaatttg gaggtggcca cattaaagat gaagtatttg gaacagtaaa ggaagatgta 540
tcattacatg gatataaaaa atacttgctg tcacaatctt cccctgcccc actgactgca 600
gctgaggaag aactacgaca gattaaaatc aatgaggtag agactgacgt ggggtgtggac 660
actaagcatc aaacactaca aggagtagca tttcccattt ctcgagaarc ctttcaggct 720
ttggaaaaat tgaataatag acagctcaac tatgtgcagt tggaaataga tataaaaaat 780
gaaattataa ttttggccaa cacaacaaat acagaactga aagatttgcc aaagaggatt 840
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tctagaaagt ctgatgtctc aaagggtaaa cttactactt tcttggtgga cagaaagacc 1560
ttaaaatatt catattactt aatgaatatg ttaaggacca ggctagagta ttttctaagc 1620
tggaacttta gtgtgccttg gaaaaggccg caagttgctt actccgagta gctgtgctag 1680

```

203

```

ctctgtcaga ctgtaggac atgtctgcaa cttttagaaa tagtgcttta tattgcagca 1740
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ctttaagggt accagatatt ttctatactg caggatttct gatgacattg aaagacttta 1860
aacagcctta gtaaattatc tttctaattg tctgtgaggc caaacattta tgttcagatt 1920
gaaattttaaa ttaatatcat tcaaaaggaa acaaaaaatg ttgagtttta aaaatcagga 1980
ttgacttttt tctccaaaac catacattta tgggcaaatt gtgttcttta tcaacttccga 2040
gcaaatactc agattttaaaa ttactttaaa gtccctggtac ttaacagggt aacgtagata 2100
aacaccttaa taatctcagt taatactgta tttcaaaaca catttaactg ttttctaattg 2160
ctttgcatta tcagttacaa cctagagaga ttttgagcct catatttctt tgatacttga 2220
aatagaggga gctagaacac ttaatgttta atctgttaaa cctgctgcaa gagccataac 2280
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attacatgcc ttctgggtgga catttttataa gtgcatttta tatcacaata aaaatTTTTT 3060
ctcttttaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 3120
aaaaaaaaaa a
3131

```

<210> 312

<211> 940

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (135)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (890)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (929)

<223> n equals a,t,g, or c

<400> 312

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aagcgtgact ctggagatgg agtccaagtt ggcggcagaa aagaaacaga cggaacaact 60
gtcacttgag ctggaagtag cacgactcca gctacaaagg ctggacttaa gttctcggtc 120
tttgcttggc atcgnacacag aagatgctat tcaaggccga aatgagagct gtgacatatt 180
aaaagaacat acttcagaaa ctacagaaag aacaccaaag catgatgttc atcagattttg 240

```

204

```

tgataaagat gctcagcagg acctcaatct agacattgag aaaataactg agactggtgc 300
agtgaaaccc acaggagagt gctctgggga acagtcccca gataccaatt atgagcctcc 360
aggggaagat aaaaccagg gctcttcaga atgcatttct gaattgtcat tttctggtcc 420
taatgctttg gtacctatgg atttcttggg gaatcaggaa aatatccaaa atcttcaact 480
gcgggtaaaa gagacatcaa atgagaattt gagattactt catgtgatag aggaccgtga 540
cagaaaagtt gaaagtttgc taaatgaaat gaaagaatta gactcaaaac tccatttaca 600
ggaggtacaa ctaatgacca aaattgaagc atgcatagaa ttggaaaaaa tagttgggga 660
acttaagaaa gaaaactcag atttaagtga aaaattggaa ttttttctt gtgatcacca 720
ggagttactc cagagagtag aaacttctga aggcctcaat tctgatttag aaatgcatgc 780
agataaatca tcacgtgaag atattgggag ataatgtggc caagggtgaat gacagctggg 840
aaggagagat ttcttgatgt gggaaattga gctgagtagg gtccagatcn ggagaaagct 900
agccttttgag ccttgaagcc ctcttacnng gggaggcttg 940

```

<210> 313

<211> 850

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (848)

<223> n equals a,t,g, or c

<400> 313

```

caaagttgat ttttaacggt tgtaaagggt tgaatgttta tagaagtgca tcatgaaatt 60
ttgtgtaaat ccagatgaac tgtcattata gtactataaa ttagagatag tccataaagt 120
tgggttgaaag gagattgaaa atatttcctt tgattaaaag aaaataatta actaacttgg 180
gcttgcttgt gattgaagag ggagattaga tagtcctctg tccccccraa aaagaaacta 240
gcagagaaaag acmtaaaaaaa gctctttggg gtctgttcat gtgctgtaca ttttttccgt 300
tttaatgtct tgtgtagata attcaaagtt tgaactatatt ctttcttgga ataagtaata 360
atttattcaa tatggtgtat ctctgagttc aatttaaaac aatccaactc agtaatatatt 420
atttttaaat acaaataccta actaaccaat taattaataa aaaggcaaga cttacttgct 480
gtagtatttg ttctcatctg tagagaactg acattggagc aaattttaag tctccccctt 540
gaaaataagc cttgttaact gagggcgtaa tacatttccc acagatttat ccagaaacat 600
tttattagag atcttatagt agtatctcag ttccctactac agcttttctaa aggatgagac 660
ttgcatttaa caaaatgaca tatataatat ttttctatag ttttgcaact gaattaaagg 720
aagggtgatgt attataatgt gtagtgaggt ataaagggct agttcattct ctcccaacaa 780
gaacttagaa taaaataaca cytttttttc atgagactta cctcattttt ggtaggctat 840
ggcagttntg 850

```

<210> 314

<211> 958

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (930)

<223> n equals a,t,g, or c

<220>

205

<221> misc feature

<222> (934)

<223> n equals a,t,g, or c

<400> 314

```

cttgcggtccc cgcgtgtgtg cgcctaattct caggtgggtcc acccgagacc ccttgagcac 60
caaccctagt cccccgcgcg gccccttatt cgctccgaca agatgaaaga aacaatcatg 120
aaccaggaaa aactcgccaa actgcaggca caagtgcgca ttggtgggaa aggaactgct 180
cgcagaaaga agaagggtgt tcatagaaca gccacagcag atgacaaaaa acttcagttc 240
tccttaaaaga agttaggggt aaacaatatc tctgggtattg aagagggtgaa tatgtttaca 300
aaccaaggaa cagtgatcca ctttaacaac cctaaagttc aggcattctct ggcagcgaac 360
actttcacca ttacaggcca tgctgagaca aagcagctga cagaaatgct acccagcatc 420
ttaaaccagc ttggtgcgga tagtctgact agtttaagga gactggccga agctctgccc 480
aaacaatctg tggatggaaa agcaccactt gctactggag aggatgatga tgatgaagtt 540
ccagatcttg tggagaattt tgatgaggct tccaagaatg aggcaaaactg aattgagtca 600
acttctgaag ataaaaacctg aagaagttac tgggagctgc tattttatat tatgactgct 660
ttttaagaaa tttttgttta tggatctgat aaaatctaga tctctaatat ttttaagccc 720
aagccccctg gacactgcag ctcttttcag tttttgctta tacacaattc attctttgca 780
gctaattaag ccgaagaagc ctgggaatca agtttgaaac aaagattaat aaagtctctt 840
gcctagtaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 900
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa gggngggcgt tttaaaggaa ccaggttt 958

```

<210> 315

<211> 500

<212> DNA

<213> Homo sapiens

<400> 315

```

cgattgaaca ggagaagcaa gcaggcgaat cgtaatgagg cgtgcgccgc caatatgcac 60
tgtacattcc acaagcattg ccttcttatt ttacttcttt tagctgttta actttgtaag 120
atgcaaagag gttggatcaa gtttaaatga ctgtgctgcc cctttcacat caaagaacta 180
ctgacaacga aggccgcgcc tgcctttccc atctgtctat ctatctggct ggcaggggaa 240
gaaagaactt gcatgttggt gaaggaaaga gtgggggtgga agaagtgggg tgggacgaca 300
gtgaaatcta gagtaaaacc aagctggccc aagggtgtcct gcaggctgta atgcagttta 360
atcagagtgc catttttttt tttgttcaaa tgattttaat tattggaatg cacaattttt 420
ttaatatgca aataaaaaagt ttaaaaaactt aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 480
gcggccgctc gaattaagcc 500

```

<210> 316

<211> 1228

<212> DNA

<213> Homo sapiens

<400> 316

```

ggcacgagct cgtgccgctt gcaactccac ctcagcagtg gtctctcagt cctctcaaag 60
caaggaaaaga gtactgtgtg ctgagagacc atggcaaaaga atcctccaga gaattgtgaa 120
gactgtcaca ttctaaatgc agaagctttt aaatccaaga aaatatgtaa atcacttaag 180
atttgtggac tgggtgtttg tatcctggcc ctaactctaa ttgtcctgtt ttggggggagc 240
aagcacttct ggccggaggt acccaaaaaa gcctatgaca tggagcacac tttctacagc 300
aatggagaga agaagaagat ttacatggaa attgatcctg tgaccagaac tgaaatattc 360
agaagcggaa atggcactga tgaaacattg gaagtgcacg actttaaaaa cggatacact 420

```

206

```

ggcatctact tcgtgggtct tcaaaaatgt tttatcaaaa ctcagattaa agtgattcct 480
gaattttctg aaccagaaga ggaaatagat gagaatgaag aaattaccac aactttcttt 540
gaacagtcag tgatttgggt cccagcagaa aagcctattg aaaaccgaga ttttcttaaa 600
aattccaaaa ttctggagat ttgtgataac gtgaccatgt attggatcaa tcccactcta 660
atatcagttt ctgagttaca agactttgag gaggagggag aagatcttca ctttcttgcc 720
aacgaaaaaa aagggattga acaaaatgaa cagtgggtgg tccctcaagt gaaagtagag 780
aagacccgtc acgccagaca agcaagtgaag gaagaacttc caataaatga ctatactgaa 840
aatggaatag aatttgatcc catgctggat gagagagggt attgttgat ttactgccgt 900
cgaggcaacc gctattgccg ccgctctgt gaacctttac taggctacta cccatatcca 960
tactgtacc aaggaggacg agtcatctgt cgtgtcatca tgccttgtaa ctgggtgggtg 1020
gcccgcagtc tggggagggt ctaataggag gtttgagctc aaatgcttaa actgctggca 1080
acataataa aatgcagct attcaatgaa tttctgccta tgaggcatct ggcccctggt 1140
agccagctct ccagaattac ttgtaggtaa ttctctctt catgttctaa taaacttcta 1200
cattatcacc aaaaaaaaaa aaaaaaaaaa 1228

```

<210> 317

<211> 1731

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1661)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1726)

<223> n equals a,t,g, or c

<400> 317

```

gcaatctttt tctctcctgg ttaaatgggg ctgttgatca ttttctctac gtaaggggaat 60
ttattgatta agtttaatta atttgatata gactgtcatg tagtgatgta gtgctatact 120
gtagtcggaa gtttttctta aaagcaaaga gcaaaaatgc aaagttttat ttgtaaaagc 180
tgaggaccct tggggatgga ttaggtttgc cgatgatcct aaaagtaagc aaactgtatg 240
acaagactac tattgcaaat gaaggatatt tatagctaaa ctgcgcacac aaaagaagtt 300
ttatatgtg agttatagtt ggttcagaaa acagtttgta ctctccctgg cccaggaagg 360
cacacagaca aaaatgtcgg ccactttttac tcaaatcacag cccaagcaca gacagtcagg 420
ttcgtgatca tcaccaacat ctgataaaat ctcatggaag gcaatgccat cacagctttg 480
ctcaattact acgaggaaga gacaacaagc atctttcgtg ttgtctcgtc tgattggagg 540
ctgaatagta gatggaatgg ggggacagtg tgcctgggtg gaggaagacg taagatcccc 600
matttggaaa gcatgcccc ctccctttta gtagaagccc atggttgccc tttgccaaac 660
tggggaggag gcaatgagcc ttggtggaag gaacctctct gtkgatattt aaagaagtga 720
gggctgtggg tattcattgt tagaaatgcc aatttcactt tgaaaccata gtccaagtct 780
ctaggttggg agaagggaaa ggaaggaagt ggtcccagtg attctagatc tggttgggaa 840
acttctgcct catgactctg tccttttgag ctttgacag cagcacaaaa cataacaatt 900
tttattttta aacagaccca ttctttttga tcccacagga gctgtgggtg ggtcggccgt 960
agccccggga tgtggtttta gtggattact gcctagctga gccaaaatgt ttgcttgtag 1020
ctgttggaac actacagcaa accgctgctt acagtgcatt gtgtatttct gtagtactgt 1080
tttgcatttt ccatagagac agaaaacttt gcaagtcaat cactgttggt cccatggtac 1140
tgtaagaaaa aaaaaaagga aaaagaaaaa aaaaaagaaa accagccaat cattgcgtgt 1200

```

207

```

acagagctaa aaattgtaat taatagagcc tgttgggaaa aaaaagaaaa caactgttgc 1260
ctttttttct tgtataaaaag agaatttatg acaaaattta gctgtgagga atgtgatacg 1320
tgtttatatt tctgaatatg gracaaattg attcatgggg atatatttta atgtaaacta 1380
aatcaggtat gtaaagttgt tttaaaatgg grgactatat aagtaattct ctaaagcttt 1440
agttggtttg aatatcatca tttcctccat ggtgagcctg cttgtgratt attaagcact 1500
tgtttgcatc ctctgttctt cactcattta tttcttgagc tgtgctatgg acttaatgct 1560
ctttctgtat tgatgaaaag cagtatgtgg gccaatcttt ttataaaaca ctatgcatat 1620
ataaatatta cattgttcat agctttatct gacttatggg nttatacata acattagaat 1680
gagtaagctg tagttgtgtg gacattttat aaaaacaaag gtcccnttcc c 1731

```

<210> 318

<211> 1208

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (29)

<223> n equals a,t,g, or c

<400> 318

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cgggtcgacc cacgcgtccg gaaagatcnt ctttaggaat aatagatgat ggtaagttcc 60
actttgggta ttggaaggca agtcattatt actggtatta gttaaaacac atatcaaatg 120
cttgctcttc atcatatata tagttatgca tacatacaca cacacacata cagtatattc 180
tttcctcaaa aggggttaaga tgtctaaaat agggacctag aagcttaaca ctattttaagt 240
aaatacagta gaagctcaca aatagatttc tttgcacaat gattttttgc aaaattttac 300
agtaataata atcccaaggc aaatctctcc tgaactgctt tccattccat aatttgtagt 360
ataattcttg gattccactg ttttcttttg ggaatggaag ttctgaatta aaagcccact 420
gtggagatgc tgtggttcat ggaatctctt ccagtgtaat tcagaatcat tggcctagaa 480
agtctctgat atttgagggg gaacaaaaat cactcacaag caatccatga tctatacaca 540
taagcataat ttccttttagt tctagttagt catcagagaa cagtcatgta tgcaagtttt 600
gtgactgaga aatttctgtg cttccaatcc acaatgagat gcatgatttt gttttcatcc 660
catttccccc aagcccctgt aaatcagggg aaatgcgcaa ctgatcgctt aggagagggc 720
ctcgtagtgg cacagctgga gatagtttca aagtctaaac caccagccca tcctgaggaa 780
agcctcctat ggaatgtaaa gtgcaatcat ttcttcagat ataagacttt cccaacaat 840
gtgattggat tcctttatgg caaaatcgag agaagctgcc atccacctgc ttatgcattt 900
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acagtgccca tgaatgggac acctgtaatg taaccacac agcgggtttg agagaatgtt 1020
agccatgact tgggctttct gaaagttggc tataatttct ctatccctac ccacaaccct 1080
gggaagttgg agcaagaggg gcatactatt gggctgggag gatttgacag catttcccca 1140
gttgcccttt aagttcttct atttcaaacg ttaattttgc ttctctttct aaaaaaaaaa 1200
aaaaaaaaa 1208

```

<210> 319

<211> 756

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (30)

208

<223> n equals a,t,g, or c

<400> 319

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ccccagtcctt accactctag catgcttgtn ataataaaca tggtagagtga ctttttttcta 60
aagatccccc ctctctcaga ggtcatgtcc tttcgttaacc agcccttgct cttgaacccc 120
cakgcagttt ggtgggttatg ccaaggaagc agactacgta gcacaagcca cccgtctgcg 180
tgctgccctg gagggcacag ccacctaccg gggggacatc tacttctgca cgggttatga 240
ccctcccatg aagccctacg gacggcgcaa tgagatctgg ctggtgaaga catgagtga 300
ccactgaacc aagaacttac tggaaagtgtg cctctgtgtc tccttcctcg ggggtaagga 360
ggggacagtg cttcccaagt tccagctgca agtccaactt aaccaacttt ccttcaaagt 420
cagttactgc caatcttctg aaaaaagcat gttccatata ctaagtctct tttctcacgg 480
taggaaataa tacagccaag atatgcagca tccttctcat tgatgtagaa aattctgcga 540
tagaccagaa aaatcctggc agcttttctc caggcatctg ggtcactaaa aactgatttt 600
ctaaaattat tggatttgta ttttgttatt aagggggaaa atgtgatttg tgctgatct 660
ttcatctgtg attcttataa gagctttgtc ttcagaaaaa ctaaaaataa aaggcattga 720
cttaaacagc tgaramaaaa aaaaaaaaaa aaaaaa 756

```

<210> 320

<211> 1209

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1203)

<223> n equals a,t,g, or c

<400> 320

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cttcgccgtc atccgcttcg aaagcatcat ccacgagttc gacccgtggt ttaactatag 60
atcaacacat catcttgcac ctcatgggtt ctatgaattt ttaaattggt ttgatgaaa 120
agcatggtat ccactaggaa gaatagtagg tggtagtgtt tacccagggt tgatgataac 180
cgctggcctt attcattgga ttttaaatat attgaacata actgttcaca taagagacgt 240
atgtgtgttc cttgcaccaa cttttagcgg ccttacatct atatctactt tcctgcttac 300
aagagaactt tggaaccaag gagcaggact tttagctgct tgttttattg ctattgtacc 360
aggctacata tctcgggtcag tagctggatc ctttgataat gaaggcattg ctatttttgc 420
acttcagttc acatactatt tatgggtaaa atctgtaaaa actgggtcag ttttttggac 480
aatgtgctgc tgcttatcct atttctatat ggtctctgct tggggtggtt atgtatttat 540
catcaatctt attccactgc atgtatttgt gttgttactg atgcagagat acagcaaaaag 600
agtctacata gcatatagca ctttctacat tgtgggttta atattatcaa tgcagatacc 660
ttttgtggga ttccagccaa tcagaacaag tgaacacatg gcagctgcag gtgtccttgc 720
attgctgcaa gcttatgctt tcttgagta tctgagagac cgattaacaa aacaagagtt 780
ccagaccctt ttcttttttg gtgtatcact agctgcagggt gctgtgttcc ttagtgtcat 840
ctatttgact tatacagggt acattgcacc atggagtggc aggttttatt cattgtggga 900
tactgggtat gcaaaaaaac acattccaat tattgcatca gtgtctgagc atcaacctac 960
gacttgggtg tctttcttct ttgatctaca tattcttgta tgtaccttcc cagcaggcct 1020
ttggttctgc atcaaaaaata tcaacgatga aagartattt ggtaagagag gtttttaattg 1080
actactttga tatggaatag ttatttttct ttttgagatt atttacttta aatttttgtt 1140
tttctatggt tgactctata tattcaagat aaattttctc ctttattttg cataggtgct 1200
tanccaaga 1209

```

<210> 321

209

<211> 668
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (653)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (654)
 <223> n equals a,t,g, or c

<400> 321
 aaagcagatg ccatctatga tatgattggt ttcccagact ttatcctgga gccc aaagag 60
 ctggatgatg tttatgacgg gtacgtaaat ttctgaagrt tctttcttcc aaaacatgtt 120
 gaatttgtac aacttctctg ccaagggttat ggctgaccag ctccgcaagc ctcccagccg 180
 agaccagtgg agcatgaccc cccagacagt gaatgcctac taccttccaa ctaagaatga 240
 gatcgtcttc cccgctggca tcctgcaggc ccccttctat gcccgcaacc accccaaggc 300
 cctgaacttc ggtggcatcg gtgtgggtcat gggccatgag ttgacgsatg cctttgatga 360
 ccaaggggcg gagtatgaca aagaagggaa cctgcggccc tgggtggcaga atgagtcctt 420
 ggcagccttc cggaaccaca cggcctgcat ggaggaacag tacaatcaat accagggtcaa 480
 tggggagagg ctcaacggcc gccagacgct gggggagaaac attgctgaca acgggggggt 540
 gaagctgcct acaatgctta caaagcatgg ctgagaaaagc atgggggagga gcagcaaytg 600
 cagccgtggg gttamcaac caccastytt ctctgtggga ttgccccag gtnntggtgc 660
 tcggtccg 668

<210> 322
 <211> 809
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (372)
 <223> n equals a,t,g, or c

<400> 322
 ggctgcagga attcggcacg agtgttaggg taaaaagtga attaaagcaa caggactatt 60
 tataaaataa ttagatttag aaagcagtcg tagaaatata agcctggagt tgcctctgaa 120
 ttacatattt aacaaaccta gaagctaaat cagtttgtct tttatcaaaa ctgcaactcc 180
 tctaagttga aagcacagtg acaagagaaa gcattacaaa ttcttgagaa ataatagaaa 240
 ttaaagctct tttcaaacct gtgaacaagt atagtaccag aagtataaga ttcagatagg 300
 cccaagtgtg agttcttgtt atgagtctta caaccctatg gactttggac aaattacttc 360
 tctgcgtctg tntcctcatc tgtaaaatga aaataatttc tgtttcatac aggtatagtc 420
 taaataggga taattacacc tacttcaaag ttgtaaaata cacaattaca actagatagg 480
 aggtataagt tctagtgttc tgtagcactg taggatgact atagttaaca atattgtata 540
 gtttcaaata gctagaagaa ggatattgca tgttcccaaa acaaagacat aagtttttga 600
 gatgatagat atgctaatta ccctaatac tatatgttat atgtattgca acatcactat 660
 gtacccccat aaatatgtac agttattgtg tattaaaatt tttttaaaact aaaattataa 720

210

gacattaaaa aaaggtatca catgtaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 780
 aaaaaaaaaa aaaaaaaaaa tcgagggggg 809

<210> 323
 <211> 1442
 <212> DNA
 <213> Homo sapiens

<400> 323
 ggcacgaggt tccctatcct gggccagttc tctcgcaggt cccagatgtc cagttccaga 60
 tgcctggacc cagagtgtgg gggaaatata tctggagaag ccctcactcc aaaggctgtc 120
 caggcgcaat gtggtggctg cttctctggg gagtcctcca ggcttgccca acccggggct 180
 ccgtcctctt ggcccaagag ctaccccagc agctgacatc ccccggttac ccagagccgt 240
 atggcaaagg ccaagagagc agcacggaca tcaaggctcc agagggcctt gctgtgaggc 300
 tcgtcttcca ggacttcgac ctggagccgt cccaggactg tgcaggggac tctgtcacag 360
 tgagctgggg atgggggggg tcccgccagg actgtggcca gggagattcc cgggggtgtg 420
 ggaagtggcg gtgccctgaa tccccatct ggaggaggga tgaattttcc atgtaggggc 480
 agtcgggctt ggcttaccgg ggagcagtg tggacccag gacacagcct cccaccagcg 540
 cctccggggc tgccatctgg gcccacaga gcaaagaggg cagcaagcag gccctgcgtt 600
 tggaaggctt atgaatggac acacaaatct tgcaaatcta tggagccagg ggcagggacg 660
 cacatattgg ttgttaaaaa tatgtcatca tgtatttgtt gagtgcctgc tctatcaggt 720
 gaggaagctg gacacaaata ataacaaaag attaagtcac cgttcacact taccttggaa 780
 gagctattac aaaacttcta acgccaagc cttattcaga ataaggacat tttaaaaaca 840
 gtacttgatg gagtgatgca agcttgcatg cccagcagta tagtcaggag actgaggctg 900
 gaggatcaga gggctggagc ccagggttca aggccagcct aagcaacata gcaagacccc 960
 atctcaaaaa taagtaaata ataaataaaa ataaaaagag cacattatct tttgatttaa 1020
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 taattattat ggatacataa tagttgtaag actttttgtt ttttaattaa agttttctaa 1140
 ggctggggcg agtagctcat gtctgtagtc ccagcacttt gggaggctga ggcgaaagaa 1200
 gcacttgagc ccaggaattt gagaccagcc tgggcaacat agcaagaccc catctctaca 1260
 aaaaaattta aaaatttagc aagtgtggtg gcacgcacct gtggtcccag ctacaagggg 1320
 cgctgaagtg agaggatcac ttgagcctgg aaggtagagg ctgcagtgag ctctgatcat 1380
 gacaccgtac tccagcctgg gtgacagagt gagaccctgt ctccaaaaaa aaaaaaaaaa 1440
 aa 1442

<210> 324
 <211> 2701
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (1)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (9)
 <223> n equals a,t,g, or c

<220>

211

<221> misc feature
 <222> (17)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2699)
 <223> n equals a,t,g, or c

<400> 324
 ncattcatnt tttcaangct cgtgatctca cggccccggt gccggccccc gctctgccct 60
 gcagcataat aaaatggcta atcaggtgaa tggtaatgcg gtacagttaa aagaagagga 120
 agaaccaatg gatacttcca gtgtaactca cacagaacac tacaagacac tgatagaggc 180
 aggcctccca cagaagggtg cagaaagact tgatgaaata tttcagacag gattggtagc 240
 ttatgtcgat cttgatgaaa gagcaattga tgctctcagg gaatttaatg aagaaggagc 300
 tctgtctgta ctacagcagt tcaaggaaag tgacttatca catgttcaga acaaaagtgc 360
 atttttatgt ggagttatga agacctacag gcagagagag aaacagggga gcaagggtgca 420
 agagtccaca aagggacctg atgaagcgaa gatcaaggcc ttgcttgaga gaactgggta 480
 tactctggat gtaaccacag gacagaggaa gtatgggtgt cctccaccag acagtgtgta 540
 ctctggcgtg caacctggaa ttggaacgga ggtatttgta ggcaaaatac caagggattt 600
 atatgaggat gagttgggtg ccctttttga gaaggccgga cccatttggg atctacgtct 660
 tatgatggat ccactgtccg gtcagaatag agggatgca tttatcacct tctgtggaaa 720
 ggaagctgca caggaagccg tgaaactgtg tgacagctat gaaattcgcc ctggtaaaca 780
 ccttgaggatg tgcatttctg tggcaaacaa cagacttttt gttggatcca ttccgargaa 840
 taagactaaa gaaaacattt tggaagaatt cagtaaagtc acagagggtt tgggtggacgt 900
 tattctctat catcaaccgg atgacaaaaa gaagaatcgg ggggttctgct tccttgaata 960
 tgaggatcac aagtcagcag cacaagccag acgccggctg atgagtggaa aagtaaaagt 1020
 gtggggaaat gtagttacag ttgaatgggc tgaccctgtg gaagaaccag atccagaagt 1080
 catggctaag gtaaaagttt tgtttgtgag aaacttggct actacggtga cagaagaaat 1140
 attggaaaag tcattttctg aatttggaaa actcgaaaga gttaaagaagt tgaaagtgga 1200
 kgccgctcmt kagaactagt ggatcccccg ggctggcagg attwcggcac gagaatgaat 1260
 ggcaaaagaaa tagaagggga agaaattgaa atagtcttag ccaagccacc agacaagaaa 1320
 aggaaagagc gccaaagctg tagacaggcc tccagaagca ctgcgtatga agattattac 1380
 taccaccctc ctctcgcat gccacctcca attagaggctc ggggtcgtgg tggggggaga 1440
 ggtggatatg gctaccctcc agattactac ggctatgaag attactatga tgattactat 1500
 ggttatgatt atcacgacta tcgtggaggc tatgaagatc cctactacgg ctatgatgat 1560
 ggctatgcag taagaggaag aggaggagga aggggagggc gaggtgctcc accaccacca 1620
 agggggaggag gagcaccacc tccaagaggt agagctggct attcacagag gggggcacct 1680
 ttgggaccac caagaggctc taggggtggc agaggggggc ctgctcaaca gcagagaggc 1740
 cgtggttccc gtggatctcg gggcaatcgt gggggcaatg taggaggcaa gagaaaggca 1800
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 tcccaaccca tcgctcagca gccgcttcag caagggtggtg actattctgg taactatggt 1920
 tacaataatg acaaccagga attttatcag gatacttatg ggcaacagtg gaagtagaca 1980
 agtaagggct tgaaaatgat actggcaaga tacgattggc tctagatcta cattcttcaa 2040
 aaaaaaaaaa ttggcttaac tgtttcatct ttaagtagca ttttgctscg atttgtattg 2100
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 tgcagaacct ttggttttgg acagtttcat ttttttggat ttgggataga ttacatagga 2340
 gtatggagta tgctgtaaat aaaaatacaa gctagtgtct tgtcttagta gttttaagaa 2400
 attaaagcaa acaaatttaa gttttcttgt attgaaaata acctatgatt gtatgttttt 2460

212

```

cattcctaga agtaggttaa ctgtgttttt aaattgttat aacttcacac ctttttgaaa 2520
tctgccctac aaaatttggt ttgcttaaac gtcaaaagcc gtgacaattt gttctttgat 2580
gtgattgtat ttccaatttc ttgttcattg aagatttcaa taaaactaaa aaatctattc 2640
aaaaaaaaaa aaaaaaaatg accctcgaga aaaaaaaaaa aaaaaaaaaa aaaaaaana 2700
a 2701

```

<210> 325

<211> 1070

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (9)

<223> n equals a,t,g, or c

<400> 325

```

gtgaaaggng catttgctat acagaccttt agaacagcaa catggagtca ttcctgateg 60
ggatgcagaa ttttgtcttt ttgaccgtgt tgtaaatgtg agagaaaact tctcagttcc 120
agttggcctt cgaggcacca tcataggaat aaaaggagct aatagagaag cccatgtact 180
atttgaagta ttatttgatk wagaatttcc tggagggtta acaataagat gctcacctgg 240
tagaggttat cgactgccaa caagtgcctt ggtgaacctt tctcatggga gtcgctctga 300
aactggaaat cagaagttga cagccatcgt aaaaccacaa ccagctgtac atcaacatag 360
ytcaagttca tcagtttcct ctgggcattt gggarccctc aaccattccc ctcaatcact 420
ttttgttctt actcaagtac ctactaaaga tgatgatgaa ttctgcaaca tttggcagtc 480
cttacaggga tctggaaaga tgcaatactt cgagccaact atacaagaga aggggtgcagt 540
tctacctcaa gaaataagcc aagtaaatca acatcataaa tctggcttta atgacaacag 600
tgtaaataat cagcaaagaa aacatgacct tcacagaaaa tttaaagaag agtgtaagag 660
tcctaaagct gagtgttggg cccaaaaaat gtccaataag cagcctaact ctggaattga 720
gaacttttta gcatctttga atatctccaa agaaaatgaa rtacagtcac ctcatcatgg 780
ggagcctcca agtgaagagc atttgtcacc acagtcattt gccatgaagg gaacacggat 840
gcttaaagaa attctaaaaa ttgatggctc taacactgtg gaccataaga atgaaatcaa 900
acagattgct aatgaaatcc ctgtttcctc taacagaaga gatgaatatg gattaccctc 960
tcagcctaaa caaaataaga aattagcatt ttatatgaac aagcctcaca gtgctaata 1020
gtaccataat gttcagtcta tggacaatat gtgttggcct gccccagcc 1070

```

<210> 326

<211> 1729

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (125)

<223> n equals a,t,g, or c

<400> 326

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cacagacgct actctgtagc atctcagggt cctctctggc gcactctgga ggaccacact 60
cgttttcttt ttggetgcca gagggccccg catccaccgc tgagctggga gaaagatggc 120
ggcancgtgc gacaggattt ggcccagctc atgaattcga gcggtctca taaagatctg 180
gctggcaagt atcgtcagat cctggaaaaa gccattcagt tatctggagc agaacaacta 240

```

213

```

gaagcttttga aagctttttgt ggaagcaatg gtaaattgaga atgtcagtct cgtgatctcg 300
cggcagttgc tgactgattt ttgcacacat cttcctaact tgcctgatag cacagccaaa 360
gaaatctatc acttcacctt ggaaaagatc cagcctagag tcatttcatt tgaggagcag 420
gttgcttcca taagacagca tcttgcatct atatatgaga aagaagaaga ttggagaaat 480
gcagcccaag tgttggtggg aattcctttg gaaacaggac aaaaacagta caatgtagat 540
tataaactgg agacttactt gaagattgct aggctatatc tggaggatga tgatccagtc 600
caggcagagg cttacataaa tcgagcatcg ttgcttcaga atgaatcaac caatgaacaa 660
ttacagatac attataaggt atgctatgca cgtgttcttg attatagaag aaaattcatt 720
gaagctgcac aaaggtacaa tgagctctct tacaagacaa tagtcacga aagtgaaga 780
ctagaggcct taaaacatgc tttgactgt acgatcttag catcagcagg gcagcagcgt 840
tctcggatgc tagctactct ttttaaggat gaaaggtgcc agcaacttgc tgcctatggg 900
atcctagaga aaatgtatct agataggatc atcagaggaa atcaacttca agaatttgct 960
gccatgctga tgcctcacca aaaagcaact acagctgatg gttccagcat cttggacaga 1020
gctgttattg aacacaattt gttgtctgca agcaaattat ataataatat taccttcgaa 1080
gaacttgagg ctctttttaga gatccctgca gctaaggcgg aaaagatagc atctcaaag 1140
ataaccgaag acgtatgaat ggatttattg accagattga tggaatagtt ctttttgaag 1200
cacgagaagc cctgccaacg tgggataagc agatccaatc actttgttct caagtgaata 1260
accttttggg gaaaattagt caaacagcac cagaatggac agcacaagcc atggaagccc 1320
agatggctca gtgaatcctt gcagaacttc tgtgcacatg acatcttttt ccatgtttgt 1380
cagatcagtt tcactatctc caaagcattt gcatcatgac cttatacatt tcaatccctt 1440
ttatgctgga ttccgtttta agaagacatt attagagcag gaagtacaag cttttaaaat 1500
atgtagtctc catatatttc agggctctct tgtattaagc taactcagat gttttgaaag 1560
ctttttcttt aaacagagggt gaaatatctg tggctaaaaa gtttgagatt tgtgataact 1620
ttgtagtcac gtaaaactta agtgcttcat gcctctccaa atgtggttat tctaataaat 1680
ggagaaatga gccaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1729

```

<210> 327

<211> 686

<212> DNA

<213> Homo sapiens

<400> 327

```

ggcacgagca tgagccactg caccagccg atactactat atccccattt tacagatgag 60
cacatgggca aattgagggg aaggcactga cccatgatca tacagctgag aagtggcaaa 120
ggcaggattt gaacctagaa cctctggctc cacacactag taatctaaac cactctccct 180
acaatacaac atacgtggta aagatgtgtg gtgggcacgc aatcaacgta ggtcccttca 240
cagttgctgg gagaggcagg aatttgagcgt tcctccgcgt tctcctcctc cgtgccccac 300
ctgtcctggg tcattcctgc agcctgccct gccctgcctg gtctcaccct ccctctgcca 360
acagaagtct gggcaggggt ttatgggctc tgataaggcc ctggcagggc cgaagtcat 420
gagcacttcc tctttgcagg agggcgtagg ggaggggacc caggtgattt gggctcctggc 480
tggtcaccag ggaagctggc aagggaaggg agactagggt gcgctctagg agaagccgac 540
agcctgagag tcccagaaga ggagccctgt ggaccctccc ctgccagcca ctcccttacc 600
ctgggtataa gagccaccac cgcctgccat ccgccaccat ctcccactcc tgcagctctt 660
ctcacaggac cagccactag cgcagc 686

```

<210> 328

<211> 1241

<212> DNA

<213> Homo sapiens

<400> 328

214

```

agacgagcgt ggcgggcgcg gctgctcggg gccgcgctgg ttgcccattg acagcggcgt 60
ctgcagctcg cttcaagatg gccgcttgct cgcattcatt ttctgctgaa cgacttttaa 120
ctttcatgtt cttttccgcc cgcttcgata gccctcsgcc ggctgctctt tccgggattt 180
tttatcaagc agaaatgcat cgaacaacga gaatcaagat cactgagcta aatccccacc 240
tgatgtgtgt gctttgtgga ggggtacttca ttgatgccac aaccataata gaatgtctac 300
attccttctg taaaacgtgt attgttcgtt acctggagac cagcaagtat tgtcctatct 360
gtgatgtcca agttcacaa accagaccac tactgaatat aaggtcagat aaaactctcc 420
aagatattgt atacaaatta gttocagggc ttttcaaaaa tgaaatgaag agaagaaggg 480
atTTTTatgc agctcatcct tctgctgatg ctgccaatgg ctctaataa gatagaggag 540
agggttcaga tgaagataag agaattataa ctgatgatga gataataagc ttatccattg 600
aatcttttga ccagaacaga ttggatcggg aagtaaaca agacaaagag aaatctaagg 660
aggaggtgaa tgataaaaga tacttacgat gcccagcagc aatgactgtg atgcacttaa 720
gaaagtttct cagaagtaaa atggacatac ctaatacttt ccagattgat gtcatgtatg 780
aggaggaacc tttaaaggat tattatacac taatggatat tgcctacatt tatacctgga 840
gaaggaatgg tccacttcca ttgaaataca gagttcgacc tacttgtaa agaatagaaga 900
tcagtcacca gagagatgga ctgacaaatg ctggagaact ggaaagtga tctgggagtg 960
acaaggccaa cagcccagca ggaggtattc cctccacctc ttcttggttg cctagcccca 1020
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ccagcaacag ccccgagcgt aaccaccaat cttcttttgc caatagacct cgaaaatcat 1140
cagtaaattg gtcacagca acttcttctg gttgatacct gagactgtta agggaaaaaa 1200
aaaaaaaaa accccggccg ctcccacttc agattggtaa c 1241

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<210> 329

<211> 1652

<212> DNA

<213> Homo sapiens

<400> 329

```

tctgactgga ctttctatta gctcaactcc accagctgtc agtagtggtc tcagtacagg 60
tgtaccaaca gtaccgttat tgccaccaca agtaaaccag tccctcactt ctgtgccacc 120
aatgaatcca gctactacat taccaggtct gatgccttta ccagcaggac tgcccaacct 180
ccccaacctc aacctcaacc tcccagcacc acacatcatg ccaggggttg gcttaccaga 240
acttgtaaac ccagggtctgc cacctcttcc ttccatgcct ccccgaaact tacctggcat 300
tgcacctctc cccctgccat ccgagttcct cccgtcattc cccttggttc cagagagctc 360
ttctgcagca agctcaggag agctgctgtc ttccctcccg cccaccagca acgcaccctc 420
tgacctgcc acaactactg caaaggcaga cgctgcctcc tcaactactg tggatgtgac 480
gccccccact gccaaaggccc ccaccaccgt tgaggacaga gtcggcgact ccaccccagt 540
cagcgagaag cctgtttctg cggctgtgga tgccaatgct tctgagtcac cttaactttg 600
aaccattctt tgggaattggc gtggtatatt taaccacggg agcgtgtctg gaaacgcaaa 660
ctatcattaa tttcatacta gtttgtagcg tatctgtagg catcctgtaa ataattccaa 720
ggggaaaact aaacgaggac gtgggttgta tcctgccagg ttgagtgggg ctcacacgct 780
agggtgagat gtcagaaagc gcttgatatt taacaacca aaaagaattg taagggtggc 840
ttgctgccag gcttgcactg ccgttcctgg ggggtgtgcat cttcgggaaa ggtggtggcg 900
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tgcctaatac tcacacgcaa catctcttgt actttgtaag tcgtttgcca gaatgcagac 1020
cacctcacta aactgtaaac ggtaaagaga tttttacttt tgggtctccg gagtcgcac 1080
tctactaagg ttacacagc aattccacct gaagacttgt gttaaagtgc tacagcgcc 1140
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aatcactcag acaacatttt gtaactgctg ctgttgcttt ctacatacac cttataaagt 1260
gacatttcaa aagaaataag gtgccacagt tttaaaccag aagggtggac tctgtggctc 1320
cttgtagtat tatagctata ctgggaaagc atagatacag caataaagta cagtaatttt 1380

```

215

```

actttttttt ttgtgtttaca tctaaattac aacccttaat tgccacgtgt gcacttacta 1440
ctctccagta tgtcttatta ctctccagta tgtcacgcat ctttaacttt tcacgtccta 1500
tgtttgcttt ctcccatttt taagagatgg taagttaact ggaattgatt tactgaatga 1560
aattaaatgc agatatccct gtttttgaaa taaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1620
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aa 1652

```

```

<210> 330
<211> 1916
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (1895)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (1902)
<223> n equals a,t,g, or c

```

```

<400> 330
gccacggcac gcagccagca agttgttttt aaatgttaat atagaaaaca gtgaaggatt 60
agctgaaaat atatgagcag gtgacattga ggtttactga aatagccaat ttgactgggtg 120
cttagactat tgtgcagtaa acctaaaagg tagtgagaga ttgcttcctg ctagcaggaa 180
gccttcatct tcttgagtac ccaaaccagg cttcagggtgt cctttgagga tagccagggt 240
tgaaatTTTT agtttctcag gaagagctct tctatgtggc aggggctgat agggcaaaat 300
aaaatgacaa tttctttatt gctacagagt atcctctata agttattaaa cgagtgtaat 360
gggtataatgc ccttccatca cacaacagga caccacccca gttttgtttt ctgggtttct 420
tccccctttg taggaatcag ataccttttg tagaaaaaaa tggcttatgc cacgtaaagg 480
tgaatTTTTa gaaaccacct tctaggcggt tttggaaccc ttactgaaat ccctccccct 540
gttacagatg gcgtagaagt cacaagtctg ttaattggac tgttgcttct ttgctgttc 600
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atatttaatg tctatacagt aaaattattc aaacttcaaa ccagtattga aagcagttgg 720
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216

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ttgttttttca atagtgacaa gaatgggttca gttctaggaa tgttctggaa gatgctgtta 1800
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```

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<210> 331
<211> 1658
<212> DNA
<213> Homo sapiens

```

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<400> 331
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aatgaatcca ggttccaata tcaacaaaca ttgctatg 1658

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<210> 332
<211> 1102
<212> DNA
<213> Homo sapiens

```

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<400> 332
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agtccattgg caagtttggc ctggccttag ctgttgccagg aggcgtgggtg aactctgcct 180
tatataatgt ggatgctggg cacagagctg tcatctttga ccgattccgt ggagtgcagg 240
acattgtggg aggggaaggg actcattttc tcatcccgtg ggtacagaaa ccaattatct 300
ttgactgccg ttctcgacca cgtaatgtgc cagtcatcac tggtagcaaa gattttacaga 360

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217

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atgtcaacat cacactgccc atcctcttcc ggccgtgtgc cagccagctt cctcgcatct 420
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tcaagtcagt ggtggctcgc tttgatgctg gagaactaat caccagaga gagctggtct 540
ccaggcaggt gagcgacgac cttacagagc gagccgccac ctttgggctc atcctggatg 600
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aaaaaaaaacc ccggggggggg gc 1102

```

<210> 333

<211> 4201

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (4077)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (4161)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (4186)

<223> n equals a,t,g, or c

<400> 333

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cctcccgtct ctgctgccgc tgccgccctg agtcaactgcc tgcgcagctc cggccgcctg 120
gctccccata ctagtcgccg atatttggag ttcttacaac atggcagaca ttgacaacaa 180
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tacggaagaa gaatgtgaat ggaaaccaga tgaagaagat gagatttcgg aggaattgaa 600
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ccagcctatg agttttgtct tagaatttca ctttgaaccc aatgaatatt ttacaaatga 840
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aaataaagac aaaacttgaa gtaactgaaa atcttatcgt gctatgtaga aatattgaac 4020

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219

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taatattcaa atatttgaat gcttttggtt cagggattgg tttaaaattg gagtcnnttt 4080
tttatggggg tagtcttaca aaaattttaag cctttatatt tttgacttta aatcaaaacc 4140
aaatgttatt ttaaattgtac nggaatwgga ttgggttaggt gcmggnagga rtgtwagggt 4200
c 4201

```

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<210> 334
<211> 1239
<212> DNA
<213> Homo sapiens

```

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<400> 334
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ggcgtgcaaa aactaacatt gaaattttga aacagcagca gagtgagtggt attttatttt 180
tcgttattgt tgggtggttta aaaaattccc cccatgtaat tattgtgaac accttgcttt 240
gtggtcactg taacattttg ggggtgggac agggaggaaa agtaacaata gtccacatgt 300
ccctggcatc tgttcagagc agtgtgcaga atgtaatgct cttttgtaag aaacgtttta 360
tgatttttaa aataaattta gtgaacctat ttttggtggt catttttttt ttaagacagt 420
cattttaaaa tgggtggctga atttcccaac ccacccccaa actaaacact aagtttaatt 480
ttcagctcct ctgttggaca tataagtgc tctcttggtg gacataggca aaataacttg 540
gcaaacttag ttctgggtgat ttcttgatgg tttggaagtc tattgctggg aagaaattcc 600
atcatacata ttcatgctta taataagctg gggatttttt gtttgttttt gcaaatgctt 660
gccccacttt ttcaacaatt ttctatgtta gttgtgaaga actaagggtg ggagcagtag 720
tacaagttga gtaatggtat gagtatatac cagaattctg attggcagca agttttatta 780
atcagaataa cacttgggtta tgggaagtgc taatgctgaa aaaattgatt atttttatta 840
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<210> 335
<211> 1249
<212> DNA
<213> Homo sapiens

```

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<220>
<221> misc feature
<222> (36)
<223> n equals a,t,g, or c

```

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<400> 335
gcaaggagtc cccaatgcaa agacacagcg ctgcgnttgg cacctccttc ctcaactccct 60
caaaattgtt aagaaatgtt agtggtgggt ctgatctgac tgcagccatc ggtaaataaa 120
agtttttgat cctgttgaac ccgcctgaga cgggtgctgtg aggggaaaagc cttccgcacc 180
cacacaggaa ttctgctgag gtcccccttc cttccggcca atggcagaag tgggggaaaa 240
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tgagtattta tctttttatt ttttattttt ttttttgaaa gaatgtcttg gaatgcgcaa 360
gtctcccttt agagccgtct tttgcaggga gcgggaagtg acaagagctc agatctccct 420

```

220

```

ccccgatctcc ctccccacct ccgaagtctc ctccgtggac cacaggtgga tctttgtgcg 480
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gacgcaggga ctaggacggc ccggtgaccg cgcggattca ggattgcggg gacgcagaaa 780
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<210> 336

<211> 722

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (690)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (703)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (718)

<223> n equals a,t,g, or c

<400> 336

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tttcatcatt catgtaacat tctcacacag ttgaggrrat tcatctcctc accaattcca 180
gattgtraat gtacywtctt aaacaactct tgagggtcacc aaacagtagt tatttgactg 240
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cagactcaat ttaaatctta cctttgattg ttgaaaaaag tcactaagat gtgaatacac 540
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tcagagtggg cacgttgggc agrtgggcac aggtgctggg gatgcccctc ckggggcaaaa 660
cgccccattt gtggcacttc cagatactan ttatttactt ttnaagagag agacaggntc 720
ac 722

```

<210> 337

221

<211> 2210

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (40)

<223> n equals a,t,g, or c

<400> 337

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ggactgagat ccagaaacca tgaacctggc catcagcatc gctctcctgc taacagtctt 180
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gacccgtgag acaaagaagc acgtgctctt tggcactgtg ggggtgcctg agcacacata 360
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cactagcaag gacgagggca cctacacgtg tgcactccac cactctggcc attccccacc 480
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cctgtgtggt cagaacacct cgtggctgct gctgtcctg ctctccctct ccctcctcca 600
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<210> 338

<211> 741

<212> DNA

222

<213> Homo sapiens

<220>

<221> misc feature

<222> (581)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (656)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (711)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (719)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (720)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (737)

<223> n equals a,t,g, or c

<400> 338

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ttcaatacat gaccgagaaa ttaggttcaa caatggatgg gtgattaaag attggnaagg 660
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```

<210> 339

<211> 2045

<212> DNA

<213> Homo sapiens

223

<400> 339

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tacgggatgc tgctcgttca ccgtatgttc gaggtgggtg gcgggcaact gaccgagtgc 240
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aaaaa 2045

```

<210> 340

<211> 2074

<212> DNA

<213> Homo sapiens

<400> 340

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cctatgga aaacgccagca acgcggcctt tttacggttc ctggcctttt gctggccttt 60
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tgagtgcagc gataccgctc gccgcagccg aacgaccgag cgcagcgagt cagtgcagca 180
ggaagcggaa gagcgcccaa tacgcaaacc gcctctcccc gcgcgttggc cgattcatta 240
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tgtgagttag ctactcatt aggcacccca ggctttacac tttatgcttc cggctcgtat 360
gttgtgtgga attgtgagcg gataacaatt tcacacagga aacagctatg accatgatta 420

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224

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cgccaagctc gaaattaacc ctcaactaaag ggaacaaaag ctggagctcc accgcggtgg 480
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gcagacgacc aaggggctgc ggcttctctt tgatggcgat gccacctcc tcatgtccat 600
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ctcctaccct gctctaccgc ttttctgggt cacagaggcc aaatgtgaga gcattgaata 2040
aatatcttaa gctaaaaaaaa aaaaaaaaaa aaaa 2074

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<210> 341

<211> 2867

<212> DNA

<213> Homo sapiens

<400> 341

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caacaatggc tatgaaggca ttgtcggtgc aatcgacccc aatgtgccag aagatgaaac 180
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gacaacacag ccaccaaatac ccaccttctc attgctgcag attggacaaa gaattgtgtg 960

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225

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<210> 342

<211> 2131

<212> DNA

<213> Homo sapiens

<400> 342

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tgcaaaataa aatattacaa ttattgcctt attcacaatg tacagaggga ttttatcata 180
caaactggcg atcctacagg gactggccgt ggaggagagt ctatctttgg ccaactgtat 240
ggtgatcaag caagcttttt tgaggcagaa aaagtcccaa gaattaagca caagaagaaa 300
ggcacagtgt ccatggtgaa taatggcagt gatcaacatg gatctcagtt tcttatcacc 360
acaggagaaa atctagatta tcttgatggt gtccatacgg tgtttggtga ggtgacagaa 420
ggcatggaca taattaagaa aattaatgag acctttgttg acaaggactt tgtaccatat 480
caggatatca ggataaatca tacggtgatt ttagatgacg catttgatga ccctyctgat 540
ttattaatcc ctgatcgatc accagaacct acaagggaac aattagatag tggtcgaata 600
ggagcagatg aagaaattga tgatttcaaa ggaagatcag ctgaggaagt agaagaaata 660
aaggcagaaa aaggaggctaa aactcaggct atacttttgg agatgggtggg agacctacct 720

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226

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gatgcagata ttaaaccctcc agaaaatgta ctgtttgtgt gttaattgaa cccagtgacc 780
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tycttgatgg acaaatttgg gttaatgggt t 2131

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<210> 343

<211> 559

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (534)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (539)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (556)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (559)

<223> n equals a,t,g, or c

<400> 343

227

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caaaaaataa ataaataaaa ataaaagagt atactcctgg catgcttttt atctgagaag 60
atgtaaaaca gggaaaagaa cttcaggccg ttctctttgt ggctgagttt cattctgcct 120
gcgtggtgac agcagccttg agctctctgg gaattcacat cctgagcagt gtgctaggag 180
gatgcgaggg atgctggtga ctctgctgtg agtttgagct gcttctgcca aaaaactcac 240
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tattctagca ccttttcatt ttgttcgaga tgtttgctga agcggagcgg tgctgtgggg 480
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acagaggcaa agaaancgn 559

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<210> 344

<211> 2623

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (547)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2623)

<223> n equals a,t,g, or c

<400> 344

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tattgacatc agtgtggagt cagtaattct tttcttagaa gctgaagtta tcattttacag 180
taaatttgggt ttttagttctt tgtcatcctt atttacctga agctccttca ggaaaattac 240
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ccacaagcgt aaggcatatg tcacttgccct ctggacactg gttattttat gtttcagtcc 1440

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228

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ctaaaaaatg aaatggaaaa aagtgggtgct aaatcgagtc agagatatta caggagagtt 1500
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aagcctacac ctagcattgc ctacttagcc ccctgaatta acagagccca attgagacaa 2280
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aggctgtgat atattttcct agtggtttga ctttaaaaaa aaataagggt taattttctc 2580
cccaaaaaaa aaaaaaaaaa aaaaaaaaaa aaataaaaaa atn 2623

```

<210> 345

<211> 1843

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1405)

<223> n equals a,t,g, or c

<400> 345

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acagtgattg actacgtgaa gccctcggat ctcaagaagg acatgaacga gaccttcaag 120
gagaagtttc ctcacattaa gctgacactc agcaaaatta ggagtctgaa acgagagatg 180
cggaacttgc gcaggaggac tgtggccttg aggagcccac ggtggccatg gcctcgtcta 240
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gcattttaatt gacaaactgg aagagaagtt ccggctgaac aggcgagAAC tgattgcctt 420
tgaattcccc gtgttagtgg ccttggaatt cgccctccac ttgcccgagc acgaagtcac 480
gccccactac agacggctgg tccagagtcc ctagcactgg ccccgaggac agccaagggc 540
awtttcttct cagcttggtg gagcagcact tacttactac tggaaatgaa aaaaagtaga 600
actcagaata ccagactttt ctccctctcg acatagtttg gggagaagca gtactagaaa 660
ctttccaagg agtcttgggt gtgtagccaa gaggagccat gagctatgga ctctcaagc 720
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ccctttacag agcagccctt agcctggggc catgggtcag gctgaccttc aacaattatt 1140

```

229

```

tctagatgat ttctggataa gaattgctct ctcggtacca gacagtttga catcctccac 1200
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gagatggctg gggcggcgcc ccacnagtgt gtattcctgt cctctatgtt agagtgcac 1440
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gaggcatgtc accacactgt cgctcatag ctgcaagaga gaggcaccag ctgaagttcc 1740
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaa 1843

```

<210> 346

<211> 884

<212> DNA

<213> Homo sapiens

<400> 346

```

ggtgtgagcc actgtgcca gcagtttccc agaatatatt taaatgcaa gttacatgag 60
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tgtgcagggt gggctggtga aggccctct cgcgaagggt gtagcaggaa aaggctcttg 180
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caatacattt cttccttcaa atcctgccac tgttttggtg gccacaact aataggacct 360
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tgggcttggc caaaacaggc tcaggccaaa gacctcccaa gctgtatgta cttccagtat 480
cctgaaacag tgtttggtga cataatgcc agggtaaaca agcctgattt aggcactgct 540
ttatccagggt gcttcacca tgaaattaat aaaacttatc tgagtcactt gaaacttgg 600
tcccagaaaa cacatttctg gtttataatc tccttttatg ctcacctgac attaattatc 660
tatccttgat gatgtgttta aactgagtag cagaaaacag aggccacact ttctgggaaa 720
ttttaaagga agaaaccatt tttaatgaga tgaaaatatt taacgaattt aaaaagctaa 780
tgacaatttt gagaaaagggt ttgggatgta tattgctatg taatttaata aactgatttt 840
atggatataa aaaaaaaaaa aaaaaaaacc tcggggtcgg gggt 884

```

<210> 347

<211> 391

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (360)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (381)

<223> n equals a,t,g, or c

<400> 347

230

```

ggcacgagggc ggcacccctgc tccgtctgca ggttggtgctt ccggtgcgga ggtcagggac 60
aagatgggtgc caccgggtgca ggtctctccg ctcatcaagc tcggcccgta ctccgccctg 120
ttcctcgggtg tggcctacgg agccacgcgc tacaattacc taaaacctcg ggcagaagag 180
gagaggaggga tagcagcaga agagaagaag aagcaggatg aactgaaacg gattgccaga 240
gaattggcag aagatgacag catattaaag tgagtgacct tgcgaccac tctttggacc 300
agcagcggat gaataaagct tcctgtgttg tgtgataaaa aaaaaaaaaa aaaaaacycn 360
ggggggggggc ccgwwaccca nttygcccaa a 391

```

<210> 348

<211> 2540

<212> DNA

<213> Homo sapiens

<400> 348

```

ggcaggcaac aggaggtcct gaactagcca gttagctact tagtccccta ttgaataagg 60
acacaattga tttcttaaat tatactgtca atgggtgatga acggcagctg tggatgtcat 120
tgggaggaac ttggatgaaa gccagagcag agtggccaaa agaacagttt attccaccat 180
atgttccacg attccgcaat ggctgggagc cccaatgct gaactttatg ggagccacaa 240
tggacaaga tctttatcaa ctggcagaat ctgtggcaaa tgtagcagaa catcagcgca 300
aacaggaaat aaaaagatta tccacagagc attccagtgt atcagagtat catccagccg 360
atggctatgc gttagctagc aacatttaca caagaggatc ccacctggac caaggggaag 420
ctgctgttgc ttttaagcca acttctaata gccatataga tagaaattat gaaccactca 480
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tctagcaaaag gaagtagtct gcattgggtg gcattacagt attttgctta atgaaagcct 2160
cagttctgaa tgttgatatg agtagttaa aggaagtggg gccattttat gtgtttatct 2220

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231

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gtgtcaagta tttctggtaa taagaagcac ttaatttaca catatttttaa tcctgtgaaa 2280
gattccacat agagaaaaga aagataccta accttcaaca aatgttattt ttggaaacac 2340
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gttgatatatt ttaacataaa tcatttagag aaattatcta gattcattaa ttttcatagt 2460
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aaaaaaaaaa aaaaaaaaaa 2540
```

<210> 349

<211> 1926

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (97)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (281)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (302)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (326)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1879)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1885)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1891)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1892)

<223> n equals a,t,g, or c

<400> 349

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gggggtggggg gacggacaag ccccgatgcc ggggganacg gaagagccga gacccccgga 120
gcagcaggac caggaagggg gagaggcggc caaggcggt ccggaggasc cscaacaacg 180
gccccctgag gcggtcgcg cggcgcctgc agggaccact agcagccgcg tgctgagggg 240
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gcgtagtagt aggacatctg tttctcgcca tcgtgataca gagaacacct gaagctctcg 600
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gacaggaaga cttggggcat gggacagctc agactttgta tttaaaagtt aaaaaggaca 1860
aaaaaaaaaa aaaggggcng gccgnttcta nnaggatcca agctttacgt accccgttgc 1920
aatgcc 1926

```

<210> 350

<211> 1233

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1222)

<223> n equals a,t,g, or c

<400> 350

```

tcctgcatgc acagttgcag ttagttattc caggtattat ttttgtttcc agaaaaagaa 60
aactcagtag aagataatgg caagtccaga ctggggatat gatgacaaaa atggtcctga 120
acaatggagc aagctgtatc ccattgccaa tggaaataac cagtccccctg ttgatattaa 180
aaccagtga accaaacatg acacctctct gaaacctatt agtgtctcct acaaccacgc 240

```


233

```

cacagccaaa gaaattatca atgtggggca ttccttccat gttaaattttg aggacaacga 300
taaccgatca gtgctgaaag gtggtccttt ctctgacagc tacaggctct ttcagttcca 360
ttttcactgg ggcagtacaa atgagcatgg ttcagaacat acagtggatg gagtcaaata 420
ttctgccgag cttcacgtag ctcaactggaa ttctgcaaag tactccagcc ttgctgaagc 480
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gccctgcttc tgacataatc cagtaaaata ataattttta agaaataaat ttatttcaat 960
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```

<210> 351

<211> 2510

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2503)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2509)

<223> n equals a,t,g, or c

<400> 351

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ctggagccca agctcttctc cacagaggac aagcaggcag cagagaccat ggggtccccct 120
tcagcctgtc catacagagt gtgcattccc tggcaggggc tcttgcctac agcctcgctt 180
ttaaccttct ggaacctgcc aaacagtgcc cagaccaata ttgatgtcgt gccgttcaat 240
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tacaactggg acaaagggga aagggtgcat gccaaactatc gaattatagg atatgtaaaa 360
aatataagtc aagaaaatgc cccaggggcc gcacacaacg gtcgagagac aatatacccc 420
aatggaaccc tgctgatcca gaacgtcacc cacaatgacg caggawtcta taccctacac 480
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agctccttca atcccatttt ctectgtggc atcactaagt ataagacctg ctctcttctt 1020

```

234

```

gaagacctat aagctggagg tggacaactc aatgtaaatt tcaaggaaaa accctcatgc 1080
ctgagatgtg ggccactcag agctaaccac aatgttcaac accataacta gagacactca 1140
aattgccaac caggacaaga agttgatgac ttcatgctgt ggacagtttt tccaagatg 1200
tccaagcct catcgtgacg aggcctttat cccactccat ttttccctgc tcatgcctgc 1260
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aangggggnc 2510

```

<210> 352

<211> 2765

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2758)

<223> n equals a,t,g, or c

<400> 352

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235

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agttccacaa agaagccaga aagcttcagt tactccatga ggagaaatgt gtgtaactat 900
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agaga 2765

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<210> 353

<211> 1755

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (134)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (140)

<223> n equals a,t,g, or c

<400> 353

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236

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gcaactcttt gaagtacgca ttttttgagt gtaaaagatc agtgttggat aacaggggcaa 300
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<210> 354

<211> 1959

<212> DNA

<213> Homo sapiens

<400> 354

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gaacaacttt ggtaatgaag agtttgactg ccacttcctc gatgaagggt ttactgccaa 240
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tgctaccggg acaggatttg actgtgctag caagactgaa atacagttgg tgcagagtct 480
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agttgccaga gcacatccca aagcaaagtt ggttttgagg attgccactg atgattccaa 660
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237

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ccctcagctg ctgaacaagc atttgtagct tgtacaatgg cagaatgggc caaaagctta 1860
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gccgccctag gggttcccaa gtttacgtac gctgcatgg 1959

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<210> 355

<211> 1067

<212> DNA

<213> Homo sapiens

<400> 355

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acaccatgta gagaattttg gtctcgattc agaaaagaga aagagccagt ggttgttgag 180
acagtagaag agaaaaagga acctatccta gtgtgtccac ctttacgaag ccgagcatac 240
acaccacctg aagatctcca gagtcgtttg gaatcttacg ttaaagaagt ttttggttca 300
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tgcagggtta gagatgttct tgattttctat aatgtcccta ttcaagatag atctaaattt 480
gatgaactca gtgccagtaa tctgcccccc aatttgaaaa tcaattggag ttactaagca 540
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gatcttttga tactttacca tgtgaaatac taccagaact gttctctaaa cccacttttt 660
ctgtagagga atgtatcatc ttttttttcc tcatattaca aatggacaaa taacggactt 720
tctattttca tatttgcgtg aaccattttt taaatgaaat taggtcatta tttatgaaaa 780
gttttgagag ggcactgtca acttgggttt aagacaggag gacattgcaa gttcacacct 840
ttcataagca taaagtgtt gcaagaaagt attttcatcc tgttaggatt catatctaag 900
atagagttat gcattgcaca tacacaaata aactttttat agatagatac ctataaaaaga 960
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tagatttgtt aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaa 1067

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<210> 356

<211> 1023

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

238

<222> (996)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (998)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1003)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1016)
 <223> n equals a,t,g, or c

<400> 356
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 gggctctggag cccccatcct cctgcggcag atgttcgagc ctgtgagctg caccttcacg 180
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 gcgcctcggg atgcccagct gatcaaggag ctggggctgc ggctgctcta tgctgtgaat 300
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 ggg 1023

<210> 357
 <211> 1953
 <212> DNA
 <213> Homo sapiens

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 <222> (45)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (47)

239

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1686)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1821)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1920)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1927)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1935)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1948)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1951)

<223> n equals a,t,g, or c

<400> 357

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240

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tcccatttta ctggctttta nggttacatt taccaccttt tctcttctct gctcccttgc 1860
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<210> 358

<211> 2026

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (701)

<223> n equals a,t,g, or c

<400> 358

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cataagggcg gcgagatcag cctcctgtct catctggaag accaccactc tggggtctca 180
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gacatcgtca gagacgtttt ctctctact ggggtgcaagc cgaaccttcc ccggcaaacac 1140

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241

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cagcccagcc ctatggccag gcctttgact gtggatgaga ttgtgggcca ggccttcac 1200
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gccaccaacc ctgactgcca agagaagctt ctgagagagg tagacgtttt taaggagaaa 1320
cacatggccc ctgagttctg cagcctcgag gaaggcctgc cctatctgga catggtgatt 1380
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aattttggaa aaatgtcact gaagtgattg aaagagtgcc tggcatgcaa ggataagagg 1920
ttctttacat aacatttctt aaatgcttaa taaacgtttg ttgcacttgg ttttgacatt 1980
gccaaaaaaa aaaataagaa gaaaatgaaa aaagttttgc gtcgac 2026

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<210> 359

<211> 1799

<212> DNA

<213> Homo sapiens

<400> 359

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cgccggggcag ctgcggagca tgtcgacccc ggcccggagg aggctcatgc gggatttcaa 180
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```

242

gaaaatggaa aatatacaag taaattctgt tgaacccaaa aaaaaaaaaa aaaaaaaaaa 1799

<210> 360

<211> 510

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (417)

<223> n equals a,t,g, or c

<400> 360

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cagaagcctc cccgaccccc caagctatct gctcacatta acaaattaaa gtgcctgaag 180
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```

<210> 361

<211> 1087

<212> DNA

<213> Homo sapiens

<400> 361

```

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aatttgttat tttctttggg ggtggaaaag gaaaacaatt caagctgaga aaagtattct 1020
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```

<210> 362

<211> 2273

243

<212> DNA

<213> Homo sapiens

<400> 362

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agcgagagca gggtgcccat cagctgcccc gagtgcagcg agcgactcaa cccgcacgac 180
atccgcttgc tgctcgccga cccgccgctt atgcacaagt acgaggagt catgctgcgc 240
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cgtcaacaga gggccagac tttacgagtt cggaccaaac acacttcagg tctcagttat 480
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```

<210> 363

<211> 1848

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (976)

244

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1845)

<223> n equals a,t,g, or c

<400> 363

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gacctcagtc acctattacc ggttggagga ggtggcaaa gcaactcct tgaagggaact 180
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa agggngga 1848

```

<210> 364

<211> 1808

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1808)

<223> n equals a,t,g, or c

<400> 364

245

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gttttaaaact ttcttattgc ctttggctgt tgattagtac agtacaagtg cgatttcaaa 1740
aagatcttga aagtaatata tttaatcaat taaaatgttt atctgtaaaa aaaaaaaaaa 1800
aaaaaaaaan                                     1808

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<210> 365

<211> 1280

<212> DNA

<213> Homo sapiens

<400> 365

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tgtacacagc cattccccag agtggctctc cattcccagg ctcaagtgcag gatccaggcc 180
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gacagggcaa ggcccaggtg gagattgtca ctgatgggga ggagcctgct gagatgatcc 720
aggtcctggg ccccaagcct gctctgaagg agggcaaccc tgaggaagac ctcacagctg 780

```

246

```

acaaggcaaa tgcccaggcc gcagctctgt ataaggtctc tgatgccact ggacagatga 840
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<210> 366

<211> 2138

<212> DNA

<213> Homo sapiens

<400> 366

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gtcaaggwga ctttataagg cacttaattg acttgctaaa accagaactt gtccgtccag 180
ctacgacttt gtatcagcat aacttgactg gaattctaga aaccgctgtc agagccacca 240
acgcacagtt tgacagtcct gagatcctgc gaaggctgga cgtgcggctg ctggaggtct 300
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aatgttcatt atcaggtcac ataaatctgc ctttatgttg cataagtgaa aatttagaaa 2100

```

247

attaaaaagca attatcttttc agatgcaaaa aaaaaaaa

2138

<210> 367

<211> 3179

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (475)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2488)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3178)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3179)

<223> n equals a,t,g, or c

<400> 367

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248

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agccaactgt ttacctcttg gttgtccccc tgaagaagcc ttcaaaccct gcaccataaa 1440
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<210> 368

<211> 1826

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1799)

<223> n equals a,t,g, or c

<400> 368

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taagtgcatt tactctcttc ctggcattga ttggtggtac cagtggccag tactatgatt 180
atgattttcc cctatcaatt tatgggcaat catcaccaa ctgtgcacca gaatgtaact 240
gccttgaaag ctacccaagt gccatgtact gtgatgagct gaaattgaaa agtgtaacca 300
tgggtgcctc tggaatcaag tatctttacc ttaggaataa ccagattgac catattgatg 360
aaaaggcctt tgagaatgta actgatctgc agtggtcat tctagatcac aaccttctag 420
aaaactccaa gataaaagg agagttttct ctaaattgaa acaactgaag aagctgcata 480
taaaccacaa caacctgaca gagtctgtgg gccacttcc caaatctctg gaggatctgc 540

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249

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agcttactca taacaagatc acaaagctgg gctcttttga aggattggta aacctgacct 600
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ttaaatcaact cgaatacctt gacttgagct tcaatcagat agccagactg ccttctggctc 720
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ttaaatctta atgttcctca aagcttggat taaatacata tggatgttac tctcttgca 1500
caaatatctt tgatacatct aaatttgtct gggttaaaaaa taggtggttag atattgaggc 1560
caagaatatt gcaaaaatata tgaagcttca tgcacttaaa gaagtatttt tagaataaga 1620
atTTgcatac ttacctagtg aaacttttct agaattattt ttcactctaa gtcattgtatg 1680
tttctctttg attatttgca tgttatgttt aataagctac tagcaaaaata aaacatagca 1740
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ccccgggggg gggcccccct cccctt 1826
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<210> 369

<211> 839

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (112)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (179)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (809)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (829)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (831)

250

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (837)

<223> n equals a,t,g, or c

<400> 369

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acaagattca tctattttaa gaaatggttg tgttctaata caaagcatta ttttactna 180
gagaaaatta cttacttgct cccttctgta ttgtaatat ttgtattaag acatgattta 240
aaatgtcttt ctacccttat ctctctaaa ctgcaactra agttcaattc ttcattcata 300
gtattttaac tctggcaaag gttatagaaa gaaaaatggr aatatggtag gcctgtggta 360
ttcttaaaag ctaagtcatt agaactatgc agatcccca gtttaaaagt acaawtacag 420
caccagtagt tagctttcta gctggggggag aagacaggag atttttcttc cacagatggt 480
tattttgctt cctgataggc actgcagcaa agccatgttg atgtgtagat gcatgacttc 540
ctcactaagc tgctgcacac cagctttgcc tgcatgattc aaatttgtgc ctcagtaaaa 600
ttataaatta ttgcatgtca taccttgaat aatggaaacg gcaaacatta aacctgtgat 660
tacccataat gtactttaat aataaaaaac atggcagcca ggtgcagtag agtgcacctg 720
tggtcaggag gctgaagtgg gaagattgct tcaacctgtg agtttgagtc ccgcctgggtc 780
aacagcgaga ccccatgtgt ctgctgctnt ctcttttttt aaaggacana ngcttanct 839
```

<210> 370

<211> 2315

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1259)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1261)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1299)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2300)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2304)

251

<223> n equals a,t,g, or c

<400> 370

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gtaaaaactg ctattatcag catcatagtt tctctaaaaa gaaaacttgg ggatcatagc 180
cgatagagag acttgctaaa atataaatca gcctctgcaa aactgtttac atattttattg 240
gtttacatat tttattgggt tatttctatc ccctgttcac tttttctctt ccacttccaa 300
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tcctcttaca agctgctttt ggcttttcatt aataacagct tccttttaga aggtctgata 420
aggrtattta aggaagraga gratgactct gttattaaag gtggctgggrg actgtgggrg 480
gatatttttt waagcactac tcatatcctt taactaaatt ttgccaagcc sgasacaaca 540
ttaaggagaa attgtacctt aagttagtaa ttccaaatct atctgagttg tatacccatc 600
aaagacaata cagttattaa catagatgaa ggtatgctat aggcattcatt cattatctct 660
atattgaata ggtgaaagat aactgtagtc aggtgaaagg cattcattat ttttaagctg 720
aaaaggggat ccttgaaaac actgaaaacc tctacaacaa tcttcaggaa gcctgctatc 780
ttgggattca ctaataatag gccaagaaca aaggcaagca tccattcctc actccaccac 840
ttttctattt cagtgggtgt crtgtctacg atgaagactt tggaaatttc ctttctcttt 900
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aaacaggaac agcaaatatt tatatttttt ccatitttgc ttttttaaat ctatgttttag 2220
aactttatat cttgggactt atgtatatat atacctttta aataaaaata attttctaaa 2280
taaaaagtta aaaaaaaaaa gggnggccgc cctag 2315

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<210> 371

<211> 3007

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2984)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2988)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3002)

<223> n equals a,t,g, or c

<400> 371

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253

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caatgccctc ataccccatgc acagtacaat aatgtactca catataacat gcaaacaggt 2400
tgttttctac tttgcccctt tcagtatgtc ccataaagac aaacactgcc atattgtgta 2460
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<210> 372

<211> 752

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (521)

<223> n equals a,t,g, or c

<400> 372

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atcatgttaa ctcatataga gggggcctta gtttatctct nctttactga attaattagt 540
tttggaattt cttttaccat taaaaaaaaat taaggaccat acagagaatg atttaagaaa 600
aaacaagtca cttaaaaaat atcacctatt tataaactgt attaattaca cataatgctt 660
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aaattagttt aggactattg tagggatggg ag 752

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<210> 373

<211> 712

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (11)

<223> n equals a,t,g, or c

<220>

<221> misc feature

254

<222> (560)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (638)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (682)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (683)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (708)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (711)
 <223> n equals a,t,g, or c

<400> 373
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<210> 374
 <211> 1807
 <212> DNA
 <213> Homo sapiens

<400> 374
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 gactggcccc cagattcctg ctgtgttaga gaattcccag gatgttccaa acaggccccc 180

255

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caggaagatc tcagtgcacct ttatcaagag ggttgtggga agaaaatgta ttcctttttg 240
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atcctggcca tgattctcac cattactctg ctctgggctc tgtattatga tagaaggag 360
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<210> 375

<211> 1815

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (201)

<223> n equals a,t,g, or c

<400> 375

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aatgagggag ttcgggagaa ggaaaactcg gaccgactgg agtggatcca ggcgcacgtg 180
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cacctgggtg cagaagatca aggcggcgctc tgagcagtac atcgacaccg agaagaagaa 600
gcgtgagaaa gcttaccag cccgctccca aaagacttca ggcattgggc gcctgatggt 660

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256

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gcatgtcatt gaagctacag aattaaaagc ctgcaaacca aatggaaaga gcaaccata 720
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tcccaagtgg aattttaact gccagttctt tattaaggat ctctaccaag acgtgctgtg 840
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aaaaaaaaaa aaaaaa 1815

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<210> 376

<211> 550

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (483)

<223> n equals a,t,g, or c

<400> 376

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ctgggcagtg aacttgagga gggcagggat tttgtctgtt cactgctggr gycccagcac 360
ccaraatact taaatctgag ttggatgaat ggccggccagc cactgggatt ccagggtctt 420
gggccccctg ccataacata tggccccargg cargcgcac atgctgggtc agtccccarc 480
ctnctgtyca caratccttc tctgttctac tccygggctg tkctcctcca cctcaactc 540
ggttctcagg 550

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<210> 377

<211> 3202

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2957)

257

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3119)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3192)

<223> n equals a,t,g, or c

<400> 377

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cgactcaggt tggcaaaaaa gcaggaaaga tgtaaatacag cagaaaaaaa acaccgagac 540
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aactagggca cttgcttctt tcttagctaa aagcaccagc tgagattttt caggtaattt 2280

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258

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tgttggttact cacttaagac tgggaattaga atgtttctgg tattttctcat ttttttccct 2340
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acccaattcg cncatatagt aa 3202

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<210> 378

<211> 2401

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (179)

<223> n equals a,t,g, or c

<400> 378

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tatgtacagt tctctgtgtt aacagctgag aagtaagcaa ccttttctga ctgcatatng 180
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259

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ctatgaagtt gtttcatccg taagtacctt tgaaccacaga agcccccttt ctcatatggt 1440
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<210> 379
<211> 852
<212> DNA
<213> Homo sapiens

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<400> 379
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gattttactg gtcattgctt tgcactttac agaactgatg attacttaga tcaaccgtgt 780
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gatttacatt cc 852

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<210> 380
<211> 2014
<212> DNA
<213> Homo sapiens

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<400> 380
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ccagtcgggt ttctttcatc ttgtagtttt tacagtattt ccactgtgca tatgcaaaat 180
gggtattaca taactgtatc atatttggtg ttgataattt tttttttttt tgagacggag 240

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260

```

tcttgctggt gccagggctg gaggggagtg cgtgggtgtga tctcgggtca ctgcaaactc 300
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gctttggctt gtggtaacaa ccacaagaag acaagcatct gtggtgcgga ggcaagcagg 1800
ctaactagga gttgacaagc taagaaagtg aaactgttct ttcttagtta actgtctttc 1860
tctggagctc tgttatttttg agtataatat ttccacgaca cttagtaaat gcaagctaaa 1920
atgtaataat aataaattgt attggagaaa cctaaaaaaa aaaaaaaaaa aaaaaaaaaa 1980
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaa 2014

```

<210> 381

<211> 565

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (557)

<223> n equals a,t,g, or c

<400> 381

```

nggggtgggg ggcctaattg gagaggtgtg ggtttsgcra gaaaraaaga aaattcccca 60
cttgaaaaga aagaggagga aactggatt ctwactttct ggatcttrac actgggctgc 120
aaaacctacc ttctctcttc ccgcctcccc taccctcaa ctctcaatgt cttgctgtca 180
ttttctgtct cggctccctc ctcccccttc ccccttcccc cccccacac ccttcacct 240

```

261

```

ctgtgtcctg gtccttctga gggccactgc agatgactct cctttgaaat gagaaaaaga 300
aaagaaagca agaacagaaa acgaagccac aggaaggga gtagacattg tatgcttatg 360
gtttctcatt atgaagggtgc agcttgtagg aggtttgtac ggatgtgctt tgaagttatg 420
tatattacat ataacaggaa aaaatattaa aataaacagt gctggtaagt atgaagctga 480
cattctaaaa ttataattat ctgactgtga ttgatgtatc ctgaggttcc tagatcttac 540
tgaactggcc cagcttngga gacct                                     565

```

<210> 382

<211> 131

<212> DNA

<213> Homo sapiens

<400> 382

```

gtcgacccac gcgtccgccc acgcgtccgc ccacgcgtcc gccacgcgt ccgaaaaaaaa 60
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 120
aaggcgggcc g                                     131

```

<210> 383

<211> 2026

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2026)

<223> n equals a,t,g, or c

<400> 383

```

gggcgcgcgg cctcgaggcc ttccgggtgc ggagaaacta ctactcccat aatgccccgc 60
ggtcccggag cttgccagtc tcgtcgcgag aagcagcggc ccggggcgac tgagcggaca 120
aacggaaagt taggttacgg tctgagacat caccgccaa gctgggcatcg gggagatggc 180
cgagactgac cccaagaccg tgcaggacct cacctcgggtg gtgcagacac tcctgcagca 240
gatgcaagat aaatttcaga ccatgtctga ccagatcatt gggagaattg atgatatgag 300
tagtcgcatt gatgatctgg aaaagaatat cgcggacctc atgacacagg ctgggggtgga 360
agaactggaa agtgaaaaca agatacctgc cacgcaaaag agttgaagg tgcataaat 420
ttatactgga atctggcatt tttccaagcc aagagaagat cgaatggctt tttgcagcta 480
actactatgt gtagacagg tttatattat aaagtatgca ttcttatcac ctagtatata 540
gttagtttgt agagtgat tttcccccagtt tcttgaacat ggtatcttca catcttggac 600
cttgggtcagt tgtgctattc attattaaac actaaaactt tggcgggttct tgcataacat 660
tgtcagat ttttagtgat ttctgtgaag tcatTTTTTT tcttgtcatt cctttttagt 720
tagttgctgt ttggataaaa gttgatgtgt gattttttat taaacaaata gtaaacccct 780
caattatagt tagtcttggg gaagtaagat gttttagtag ttttagagttc tttaattctt 840
ggcacaacgt gactgttgag ctaacaccaa atagtgtgtt ggcaataact ttcaaatggc 900
tgaaaacacc taaaaattgt tcattcagaa atatctgtca ctgctctgtt gccaaaactc 960
agaatagaac ttagacgtat gtctgagtcc ctgagatcac atgctaaagt cgatgaaaag 1020
taaccactgc cactgtcttg tgtcagaact ttacagtac agaaaataac agaatagcct 1080
tctgtaatga ggcgtttgtt agagttttgc atgagattct aatacttcag taggacccta 1140
cctacgtggg tcatctacaa tggttaccat aaaaaatctg gcaggat tttt aaaactcaat 1200
cagtctttcc tttgagctag tgacttgaaa agaaagagag aaggaaaaga gaccatatta 1260
agtccatgcc agtttgcttg ctagaatatg atcaacgact tgtagtagac tcaagttttt 1320
aaaaaacact attttactta aactgtttct tatctaaatt cttgcagagt gtcaatgtta 1380

```

262

```

tcattgatta tagaagacag ggataataacc tttatctctg gccactcaaa aatgcagtgc 1440
caggagtgct aaacctagag gccaataactg atgacctgga aggtgatcca tatgattgtc 1500
accacaaaagt gctttttacac aaaaacttga aaatttgaaa aacatgattt ttttaagttt 1560
ctcatctcac cagtcttggg rtttatattg caaatctatc aaagtaagaa ataatttgtg 1620
ctgtatacaa attacatggg gaacataaaag gagtgagatc cttctgtgat aaaatgaatt 1680
caccactctg gttacccaac tacagaacct cctttgatca ggccagtagg ttgtgatgca 1740
ggctggagcc cccgaatgcc ccacacacac tgcagcattg accagaccat ccgaaacctg 1800
cgtccctggg gatgttctca agcctcggaa gtggcaaatg gaaatgatat ggccggttgc 1860
ggttgtagga gagttgtgac ttaggcagga gtcgacctcc tcaagtaatg gaacgatttc 1920
aaaggcaggc tgccctgacc aaaaatatct gccatgaata aaggtgcctg aaatcctgct 1980
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaan 2026

```

<210> 384

<211> 1346

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (249)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (251)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1334)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1342)

<223> n equals a,t,g, or c

<400> 384

```

tcgaccacgc gtccgcgcgc gcggcggcgc cgaggcgaag aaggaggagt gtgtgcggcg 60
gggccgcgcg ggtaaaggcg agaaggctgc aggagaccga gggggagccg ggccggtggg 120
gccgccgccg ccgccatgca ggaaatcatc gccagcgtgg accacatcaa gtttgacttg 180
gagatcgccg tggagcagca gctgggggcg cagccmctkc cscrgcagac acagcctcca 240
gcaaagcana naaccccgca ggtcatcggt gtcatgcaga gtcaaaacag cagcgcgggc 300
aaccggggac cccggccact ggagcaggtc acctgttaca agtgtggcga gaaaggacac 360
tacgccaaca gatgcaccaa agggcacttg gcctttctca gtggacagtg acagcagctg 420
gagccagctc cgagcagccc gggggccccc ctgttgggag tgtgcattta actgtttcat 480
gcgcttggtg gcgcgactgt ggctcgagct ggccccgaga cacgtgggtt tcatcactct 540
gagggggccac gtctgttagt ttccatcatc tttgccttag tattttttga aaaagggaca 600
tgtgtcctgt ggggtccctgc agtcgacatc atgtttggct gggcatcgat gcctccttct 660
tgggactccc ggcacaactc ccctcatcca gggagggagg cagctgctgg ggaggggctt 720
ggctaggtag ttctgtgtgg cgggtggcat tccctcatt aaacaccagt tcttgggtgac 780

```

263

```

gccaggggct ggtaggatcat tcaaagctgt ggccagctca cgctgcttc ctccctccct 840
gccctgctga atcctaaagc tgtgcctata tctgtgattt gaatgaggga gccctttggg 900
gcaaattcag gtgcccccat tgcctcaggc tggccctggt cccagggtggc agcgggttgag 960
gaggggtaca gggctctcaa gcctgagggt ttcttctctg ggcttaattt tctcttgggg 1020
tacgtgctg acagtgttta aggtgtccgt tgaactggag ttgcagactt ttaaatagat 1080
gaccccttca gatcatctgt gcctacctcc tgcccatcag gcgtctacac tgtcactcag 1140
acacctgtgg catgtggagg agactgccct gtccctgagcc tggaaaatgt gaaactgtct 1200
cctgcaacct gctgggcatg tgggcctggc tgtgttcaat tgcaagaaca atttttatga 1260
aatggattaa agcttgtttt ttaaaaaaaaa aaaaaaaaaa ytcggggggg gscctgtacc 1320
cattggccct tggngggggg tnttaa 1346

```

<210> 385

<211> 637

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (637)

<223> n equals a,t,g, or c

<400> 385

```

gcccacgcgt tcgcccacgc gtccgcccac gcgtccgaat ttcacgtttt tatgtaagca 60
tgaaacacag gcagtatgag agaaagcaag gcccgatcat ctgtccgtac actacgtatg 120
ctgtagagcc attttgtatg ttgtgtaaaa caaaaagcat tgatgaaaaa gcaaaagggtg 180
atgtatgtat atgagaaaaa taattgtacg atatcattcc agtacgtttt gttgtacatt 240
ttagtcttgt ttactttctc ttcattgtta agaggatgcg aactgtacag tttccagcta 300
gttaccata ttagagaaga aataagagag tattagaaga aaacaggaga gaaagaacat 360
ttgtgaattg cagttgtcaa aaaaaaaaaa tagcctagct ggcttattt gtgaagcata 420
attgctttta gcatatggaa gtattttttc acattttctt tgtataaaat ttgtattaaa 480
cttaaatatc tttttgatgg tgggtgtttct ttgtgactga gccagtagac tcacactata 540
tgcttttttg ggtttgcccg ttccttcccc ccccccccca gttttttcag atttytttac 600
ctttttttta ttaaaactgt ttggaaaaaa aaaaaan 637

```

<210> 386

<211> 862

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (723)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (760)

<223> n equals a,t,g, or c

<220>

<221> misc feature

264

<222> (780)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (809)

<223> n equals a,t,g, or c

<400> 386

```
ggggcagttg ccgcggcgcg cgcgatccgg ctgacgcac tggccccggt tccccaaagac 60
cagagcgggg ccgggaggga gggggaagag gcgagagcgc ggagggcgcg cgtgcgcatt 120
ggcgcgggga ggagcaggga tcttggcagc gggcgaggag gctgcgagcg agccgcgaac 180
cgagcgggcg gcgggcgcgc gcacatggg ggagaaaccc gggaccagct caccgtgtac 240
ttgggcaagc gggacttcgt agatcacctg gacaaagtgg accctgtaga tggcgtggtg 300
cttggtggacc ctgactacct gaaggaccgc aaagtgtttg tgacctcac ctgcgccttc 360
cgctatggcc gtgaagacct ggatgtgctg ggcttgtcct tccgcaaaga cctgttcac 420
gccacctacc aggcttccc cccggtgccc aacccacccc ggccccccac ccgcctgear 480
gaccggctgc tgaggaagct gggccagcat gcccamccct tcttcttcac cataccccag 540
aatcttccat gctccgtcac actgcagcca ggcccagagg atacaggaaa ggcctgcggs 600
gtrgactttg agwtcgagcc ttctgtrcta aatcactaga agagaaaagc cacaaaagga 660
actctgtgcg gctggtgatc cgaaagtgca ttgcgcccgg agaaaaccgg gccccagctt 720
tanccgaaaa caaaaggcat tccttcatgt ctgaacggtn cctggaactt cgaaggtttn 780
ccttggaaaa aggagctgta cttaccatng gggagccct tcaatggtaa aatgttccaa 840
gttaacccaaa aaaatttcaa cc 862
```

<210> 387

<211> 585

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (375)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (474)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (573)

<223> n equals a,t,g, or c

<400> 387

```
gctgcaaaaca aaaagaatga agctcgactg agaattgtaa aaactcttga agacattgat 60
ctgggcccta ctgaaaaatg tgtgagagtc aactcagttt ccagtgggtct ggcggaagaa 120
gacctagaga cccttttgca atcccggtc ctcccttcca gcctgatgct accaaagggtg 180
gaaagtccctg aagaaatcca gtggtttgca gacaaatttt cattccactt aaaaggccga 240
aaacttgaac aaccaatgaa tttaatccct tttgtggaaa ctgcaatggg tttgctcaat 300
```


265

```

ttaaaggcag tgtgtgaaga aaccctgaag gtcgggcctc aagtaggtct ctttctagat 360
gcagtcgttt ttggnaggag aagactttcg agccagcata ggtgcaacaa gtagtaaaga 420
aaccctggga tattctytac gcccggcaaa agwttkttgt catagcgaaa cctnttgggt 480
ctccaagccg tagatctggg tgtacattga ctttcgagat gggagctggg gcttgcttag 540
gacagttcac ggaggaaggg agccgccatg ggnntttcac tgggt 585

```

<210> 388

<211> 591

<212> DNA

<213> Homo sapiens

<400> 388

```

gtgatctgca tgtggcaggg ctgcgcagtg gagcggccag tgggcaggat gacgagccag 60
acccctctgc ccagtcctcc cgggccagc cggccgacga tgtctactgt tgtggagctg 120
aacgtcgggg gtgagttcca caccaccacc ctgggtaccc tgaggaagtt tccgggctca 180
aagctggcag agatgttctc tagcttagcc aaggcctcca cggacgcgga gggccgcttc 240
ttcatcgacc gcccagcac ctatttcaga cccatcctgg actacctgcg cactgggcaa 300
gtgcccacac agcacatccc tgaagtgtac cgtgaggctc agttctacga aatcaagcct 360
ttgggtcaagc tgctggagga catgccacag atctttgggt agcaggtgtc tcggaagcag 420
ttttttgctgc aagtgccggg ctacagcgag aacctggagc tcatgggtgcg cctggcacgt 480
gcagaagcca taacagcacg gaaktccagc gtgyttgtgt gcctggtkga aactgaggag 540
caggatgcat attattcaga ggtcctgtgt ttttcttgca ggataagaag g 591

```

<210> 389

<211> 1096

<212> DNA

<213> Homo sapiens

<400> 389

```

ggcagagcaa gatgggggct taccacacca tcgagctgga gccaaccgc cagttcaccc 60
tggccaagaa gcagtgggat agtgtggtac tggagcgcat cgagcaggcc tgtracccag 120
cctggagcgc tgatgtggcg gctgtggtca tgcaggaagg cctcgcccat atctgcttag 180
tactccccag catgaccctc actcggggcca aggtggaggt gaacatccct aggaaaagga 240
aaggcaattg ctctcagcat gaccgggcct tggagcgggt ctatgaacag gtggtccagg 300
ctatccagcg ccacatacac tttgatgttg taaagtgcac cctggtggcc agcccaggat 360
ttgtgaggga gcagttctgc gactacatgt ttcaacaagc agtgaagacc gacaacaaac 420
tgctcctgga aaaccggtcc aaatttcttc aggtacatgc ctctccgga cacaagtact 480
ccctgaaaaga ggccctttgt gaccctactg tggctagccg cttttcagac actaaagctg 540
ctgggggaagt caaagccttg gatgacttct ataaaatgtt acagcatgaa cggatcgag 600
ctttctatgg actcaagcag gtggagaagg ccaatgaagc catggcaatt gacacattgc 660
tcatcagcga tgagctcttc aggcacagc atgtagccac acggagccgg tatgtgaggc 720
tggtggacag tgtgaaagag aatgcaggca ccgttaggat attctctagt cttcacgttt 780
ctgggggaaca gctcagccag ttgactgggg tagctgccat tctccgcttc cctgttcccg 840
aactttctga ccaagagggt gattccagtt ctgaagagga ttaatgattg aaacttaaaa 900
ttgagacaat cttgtgtttc ctaaaactgtt acagtacatt tctcagcatc cttgtgacag 960
aaagctgcaa gaakggcact ttttgattca tacagggatt tcttatgtct ttggctacac 1020
tagatatattt gtgattggca agacatgtat ttaaacaata aactaaaagg aaataatcwm 1080
mamrtaaaaa aaatgc 1096

```

<210> 390

<211> 448

266

<212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (76)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (132)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (394)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (439)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (447)
 <223> n equals a,t,g, or c

<400> 390
 tcggaggacg cgaaccggca cgctgcgcct ttaaggagtc cggctgggct gggcgccgga 60
 gctgggagcc gcgcgngtag gagcccggcg caggggccca gcccggggct agagaccgag 120
 ggccgggggc cnggcccggc ggcgggaccc aggcggttga ggctggtcag gagtcagcca 180
 gcctgaaaga gcaggatgga tcttgatgtg gttaacatgt ttgtgattgc gggcggcacg 240
 tggccatccc aatcctggca tttgtggctt catttcttct gtggccttca gcactgataa 300
 gaatctatta ttggtactgg cggaggacat tgggcatgca agtcgcgtat gttcaccatg 360
 aagactatca gttctgttat tccttcggg gcangcctgg gcamaaamcc tccatcctca 420
 tgctccacgg attctcttnc cacaagnt 448

<210> 391
 <211> 1451
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (17)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (18)

267

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1429)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1440)

<223> n equals a,t,g, or c

<400> 391

```

gtcgcacccac gcgtccnncc acgggtccggt ggggagaagc cgggaggact ggggtgcgcct 60
gcagggatcg gaagccggtt ggggtgtgag aggtttttctc gctctaggga gattcttcaa 120
gcaatcacta tgtcaacaga cacagggtgtt tcccttcctt catatgagga agatcaggga 180
tcaaaaactca ttcgaaaagc taaagaggca ccattcgtac ccgttggaat agcgggtttt 240
gcagcaattg ttgcatatgg attatataaa ctgaagagca ggggaaatac taaaatgtcc 300
attcatctga tccacatgcg tgtggcagcc caaggctttg ttgtaggagc aatgactgtt 360
ggtatgggct attccatgta tcgggaattc tgggcaaaac ctaagcctta gaagaagaga 420
tgctgtcttg gtcttgttgg aggagcttgc tttagttaga tgtcttatta ttaaagtta 480
ctattattgt tggaaataaa ctaatttgta tgggtttaga tggtaacatg gcattttgaa 540
tattggcttc ctttcttgca ggcttgattt gcttgggtgac cgaattacta gtgactagt 600
tactaactag gtcattcaag gaagtcaagt taacttaaac atgtcaccta aatgcacttg 660
atggtgttga aatgtccacc ttcttaaaatt tttaagatga acttagttct aaagaagata 720
acaggccaat cctgaaggta ctccctgttt gctgcagaat gtcagatatt ttggatgttg 780
cataagagtc ctatttgccc cagttaattc aacttttgtc tgcctgtttt gtggactggc 840
tggctctgtt agaactctgt ccaaaaagtg catggaatat aacttgtaaa gcttcccaca 900
attgacaata tatatgcatg tgtttaaaacc aaatccagaa agcttaaaaca atagagctgc 960
ataatagtat ttattaaaga atcacaactg taaacatgag aataacttaa ggattctagt 1020
ttagtttttt gtaattgcaa attatatttt tgctgctgat atattagaat aattttttaa 1080
tgtcatcttg aaatagaaat atgtatttta agcactcacg caaaggtaaa tgaacacgtt 1140
ttaaatgtgt gtgttgctaa ttttttccat aagaattgta aacattgaac tgaacaaatt 1200
acctataatg gatttggtta atgacttatg agcaagctgg tttggccaga cagtataccc 1260
aaacttttat ataatataca gaaggctatc acacttgtga aattctcttg tctaactctga 1320
atttgcattc catggtgtta acatggtata tgtattgtta ttaaagtaag tgacccatgt 1380
caaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaana aaaaaaaaaa 1440
aaaaaaaaaa a 1451

```

<210> 392

<211> 1425

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (48)

<223> n equals a,t,g, or c

<220>

<221> misc feature

268

<222> (1332)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1381)

<223> n equals a,t,g, or c

<400> 392

```

agttaataag taaaagctac taacaattaa aaaataaata aataaagnca agactgtctg 60
gaaaatggct ctctaaaaag gaccagttgc catcatccac agtggaagat tcaaagcagt 120
tggtccttgg tacgtatgag aagcggattt cattcccttg aattctacag agcagtttat 180
tagagtgaat gcatttttaag gccttgcatt tgatatgtca tccagttcat aatcaagttg 240
cctttttctg gctaaaaacat aatgattatg tatttttctc atttggtcct acaagctgct 300
ggccctttgt ccctccactg tgggaatcag atctagagca ggctgagcct gcagacacag 360
cagtggccaa aagggtcactc taagtgtttt gtcttgactc cttacttgaa gtccacccag 420
ctagcacaca tctggtttat actgaagccc cctgcctaga aatactcatt tcaggaacca 480
ccagtaagca tctgtgacca cacaggcttt ttgactgatg gcttcccgga tctggtttca 540
agggataacc ccgtctgtgt gcatctatgg tcttctctct acagcgagga ctttgcagtg 600
ctgcttgtgg tccacacaag gggctcagag ctgagctga actgcttcat ggtcaccagc 660
tctgtccct tccagtcttg agaggctttt ttctccagat ggaacctttc cttcccgcg 720
ttttctcggg ctctggctgt ttttctcttg tgcccgctca attggacacc tcctggcttc 780
catctctgtg gttctcctgc ctcacttctt gttctgttgt ttttccgttt tgtcaaaata 840
tctctatgt tcttggcttc cttttctctg ccaggttttc agctttcctt tagctcttct 900
tctaatatgg ctctgcca caaaagcctg ctctgtcagg atctcatggg tctccacttg 960
ccagaacctt cttcagctc agttcctcgg cctcaacttg tacgtttaac ccattgacca 1020
ccamccccca aattcacctt catttctttg accctgctcc tcactccttt tctgttgarg 1080
aatctgttga ctaactccag gctcactcag gctcacgctc ctgctctctg caccagcctt 1140
tccagagcgt gccagttctc atggcttcat ctgttaactg tkgatcgctt cagtccctgat 1200
tttttagacct aaatggtttc cttaacgcca ttctaactgc ctgtgactca ttttcaacta 1260
cagtgtttat tgtaacgcca aaccaacaaa tcacaggtgc ttgcttctct ccataaatct 1320
caacagtcta antttttgtc attcaacatg actcgtttat ccaacctgaa atcgcatata 1380
nccgcaaata tgggtgtagg gacttccgta gaagttccct tagat 1425

```

<210> 393

<211> 4755

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (124)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2562)

<223> n equals a,t,g, or c

<400> 393

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269

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270

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<210> 394

<211> 3039

<212> DNA

<213> Homo sapiens

<400> 394

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atgtatgtca gttggacatt gtagaaggta tgtaaatcag catagtgtg tataacttaa 900
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271

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<210> 395

<211> 3276

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (3258)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3260)

<223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (3262)
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<220>
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 <222> (3263)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (3270)
 <223> n equals a,t,g, or c

<400> 395
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 gggaagaaat cagactgctg tgagagaaga gatgwtctc ctggcaaact acttggatag 180
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 aacagaaact gagtgtgaga gttgtgaaat acaaggaaat gcagtaaagc cagggaattt 2100

273

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acaataacat ttccgtttcc atcattgaat aagtcttatt cagtcacgcg tgagggttaat 2160
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<210> 396

<211> 1632

<212> DNA

<213> Homo sapiens

<400> 396

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274

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tacaacccta tagataatgt tttttgcttg attgacttat ataatcactg tttcatgatt 1500
actgcttttg gaataatagg aagttttgtg aaatgctggc cttgtgtata tcttagaatg 1560
caaatttaat aaagtgtgta tacatgcata aaaaaaaaaa aaacctcggc cgcgaccacg 1620
ctaagccgaa tt 1632
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<210> 397
<211> 808
<212> DNA
<213> Homo sapiens
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<400> 397
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```

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<210> 398
<211> 2428
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc feature
<222> (1025)
<223> n equals a,t,g, or c
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275

```

aagctcgtgc tgcagaaaga gctatagctg aagagaaaag ggaagctgcc aatttragac 900
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<210> 399

<211> 2732

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (699)

<223> n equals a,t,g, or c

<400> 399

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tgrtcatgca gttacttagg gacaatctca ctgtaagtac tacttccaca gggtttatag 300
tctctttcct attcacctac ttaataattc actgttatct tcaagagggg atttgtacca 360
ttaaatgtag ttacagtttt aagtgtttaa atttgttata aatgactgct gaagttttga 420
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cttcctttct cttgcagctg tggacatcgg aaaaccagg agacgaagga gacgctgggg 600
agggagagaa ctaatgtttc tcgtgctttg tgatctgttc agtgtcactc tgtaccctca 660
acatatatcc cttgtgcat aaaaaaaaaa aaaaaaana gaatcgtacg tcgacttttc 720

```

276

```

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<210> 400

<211> 1362

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1175)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1250)

<223> n equals a,t,g, or c

<220>

277

<221> misc feature
 <222> (1263)
 <223> n equals a,t,g, or c

<220>
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 <222> (1285)
 <223> n equals a,t,g, or c

<220>
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 <222> (1343)
 <223> n equals a,t,g, or c

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 canagagcca ttctatgtca aacanttcag gactctttga ggaaggttat cgcagatcac 1320
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<210> 401
 <211> 1403
 <212> DNA
 <213> Homo sapiens

<400> 401
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 aagatttttca aggaaattca tattatata tcaaaaaatg atttatcaat gttatctacc 180
 aaaagaaata atttttattt tccccctttg ggagatatta tcctctaata tgagaatcag 240
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 ttctgtgcct tagttttctc actcgtaaac aatttcctat aaaaattggt taaacaccaa 360

278

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ccaaaattta ccatatgtat tcattctctt gccttaaaga tcacttctta acttacattt 420
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<210> 402

<211> 2387

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1257)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1316)

<223> n equals a,t,g, or c

<400> 402

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279

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<210> 403

<211> 4062

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (111)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (4061)

<223> n equals a,t,g, or c

<400> 403

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281

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<222> (820)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (849)

282

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (854)

<223> n equals a,t,g, or c

<400> 404

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<210> 405

<211> 1030

<212> DNA

<213> Homo sapiens

<400> 405

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<210> 406

<211> 2428

283

<212> DNA

<213> Homo sapiens

<400> 406

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2428

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<210> 407

<211> 2047

<212> DNA

<213> Homo sapiens

284

<400> 407

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aaaaaaaaa 2047
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<210> 408

<211> 892

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (21)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (33)

<223> n equals a,t,g, or c

285

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<220>
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 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (891)
 <223> n equals a,t,g, or c

<400> 408
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<210> 409
 <211> 696
 <212> DNA
 <213> Homo sapiens

<220>
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 <223> n equals a,t,g, or c

<220>
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<400> 409
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286

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<210> 410

<211> 1885

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (741)

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<400> 410

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287

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cgatcccaca gctcaaaaa aaaaa 1885

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<210> 411

<211> 584

<212> DNA

<213> Homo sapiens

<400> 411

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<210> 412

<211> 1412

<212> DNA

<213> Homo sapiens

<400> 412

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agccaatgat ccctttgctt ttaatgtata gaaaatactg ttgttccttt tgtcatttcc 180
agtgcacatc gttttctaa gagctctttt ctaggaggga aaccaaagg gctagggtta 240
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288

<210> 413
<211> 364
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (363)
<223> n equals a,t,g, or c

<400> 413
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cactgtcacc ggcctcaggg agtttatgtg taatagaatt aaaaataata gctgtgtata 180
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taaaattcag caaaggactt gatagcctct ccccgcttt tcaataaagg atgaatgaag 300
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ccnt 364

<210> 414
<211> 1333
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1140)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1196)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1210)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1246)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1285)
<223> n equals a,t,g, or c

<220>

289

<221> misc feature
 <222> (1287)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1306)
 <223> n equals a,t,g, or c

<400> 414
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<210> 415
 <211> 3146
 <212> DNA
 <213> Homo sapiens

<400> 415
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 ccaattcgaa ttgcctgtgg caaggagtgt tggccatttg gaaatatcat aggtgttggc 180
 cccagtgta gagttatgtt cataagtctt tgagttggaa acctttactt tccttcataa 240
 gtccatctat tcctataaca ttcttaagaa atgttacttg gggttatggc aacttatgtc 300
 gccacaaaga cccaccacca ccaatggaaa ccattcagga gattcttcca gccctttgtg 360
 ttttaattca tcacacagat gtaaataatac tggtagacac agtctgggcc ctctcttacc 420
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 tgggttcctct gctcagccac caggaagtta aagttcagac tgctgcactt agagctgtgg 540
 gcaacattgt tactggaaact gatgagcaaa cacaagtagt tttgaaactgt gatgctcttt 600
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290

```

tcctctccaa catcactgca ggaaatcagc agcagggtaca ggcagtaatt gatgccaatc 720
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cttggggccat aagtaactta acaattagtg gaaggaaaga tcaagtggct taccttatcc 840
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aaaaaaaaatc gagggggggc ccgtac 3146

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<210> 416

<211> 594

<212> DNA

<213> Homo sapiens

<400> 416

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acatacgaaa tttgacaggt attgtatacc ctttggatct ttaggaatta atttttgcct 60
ctgtcactca gctttgtata ttttgaatg gagataagta tagggaggtc ttggaaggaa 120

```

291

```

aattgccaga attcccaaac catgtaacac tcattgagaa ttccagatcc attatatcta 180
aagggcaagt gaaggaaaca gtattgtgaa ctgggtataa ctcccttggt cttactagt 240
acattcttaa tctgtgagac ccaaagggtg ataaacaata atttaagatt gtacagtact 300
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ctatggcaag ttcattaaaa agcttgctcc attgttatct tcaagtaatg cccataagga 480
gatggaagat atctgagaca attaaggctt tagcttctag gcaagagaaa taacgttgca 540
ttaaatttca agtttctttc tgctagactt gaatgtgtct agccactcta attt 594

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<210> 417

<211> 562

<212> DNA

<213> Homo sapiens

<400> 417

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cagcaagaga aagcgcctgag agctcgcagg ttcattaaag aaggcaaagc actggtttct 180
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tcgcagcttt gggcagcttt gagaagcggg acaagagttc tgtgcctgtg tgtccagccc 480
tggagccagc cagtgcattt attttaagct cttagaagca actccttggc ccaggaatgc 540
gtgacccctg agatgggtcc ac 562

```

<210> 418

<211> 1412

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1218)

<223> n equals a,t,g, or c

<400> 418

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tcaagagcag gcaccgcctc caggacaacg tgcgcgagga cctctatgag gctgctgaca 780
agtgggtggc tgctgtgggc aaggaccggc ccttcatggg gggccagaag ccgaatctcg 840

```

292

```

ctgatttggc ggtgtatggc gtgctgctg tgatggaggg gctggatgca ttcgatgacc 900
tgatgcagca cagcacatc cagccctggt acctgcsagg ggagagggcc atcaccgagg 960
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tgcaataaag gaaaggtttg tggcgccaaa aa 1412

```

<210> 419

<211> 1939

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1872)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1884)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1889)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1924)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1929)

<223> n equals a,t,g, or c

<400> 419

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caagctaagg gtgatcagcc catgacctaa acctccagac aaaataaaac ggaaaatttg 180
ctagaatcaa gaatgatgga tccatgttca gttggagtc agcttcgtac tacaaatgag 240
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tgctttcatc atgtaaaaat ttacattgac agatttgagg atttacagaa gtcattgttg 420
gacccattta acatacacia gaaattagcc aaaaaaaatt tgcattgaaat tgacttagat 480
gatgccactt ttctgagtcg taaatttgga agacagcttg tacctgggtg gaagctttgt 540

```

293

```

ccaaaatgca cacagataat caatggaagt gtggatgttg atactgaaga ccgccagaaa 600
aggaaacctg agtcagatgg aagaactgct aaagctttga ggtcattaca atttacgaat 660
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aaggcaaaact taccaacaca aataagcaaa gtggttgcaa taaagacaga tacgtcccag 1800
aggaagtgat ggttaaaaaa aaaaaaactt tacmttaaaa grtatattaat gtgaatatrg 1860
raatattyca cnacmttgaa agcnccagnc ataaagggtg gaagctggcc ccaacttaga 1920
aggngtatng cagttgccg                                     1939

```

<210> 420

<211> 576

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (545)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (550)

<223> n equals a,t,g, or c

<400> 420

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aatggaggga aataaatgac tggatggctg ctgcttttta agtttcaa atgacattcca 120
gacaagcggg gcctgagccc gtgcctgtct tcagatcttc acagcacagt tcctgggaag 180
gtggagccac cagcctctcc ytgaataact gggagatgaa acaggaagct ctatgacaca 240
cttgatcgaa tatgacagac acygaaaatc acgactcakc cccctccagc acctctacct 300
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gccactgtg gactctgagg cctctgcatt tgccgggtgt ctgcctgtga tattttgggc 420
atgggctggt ctggctcggt tcccatthgt ctggccagtc tctrtgtgtc ttaatccctt 480
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```

294

<210> 421
<211> 951
<212> DNA
<213> Homo sapiens

<400> 421
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ataatctgta atgttatgaa gacctatcaa aaagttttaa aagtatttct gtcttcaaag 180
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cacaattata gaatggatat atgtttctga aaagttttgg aaagaaagca aaagtcttag 480
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<210> 422
<211> 673
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (12)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (76)
<223> n equals a,t,g, or c

<400> 422
gccgaaatga antaaacggg gtaaacaactc cctgctgcc cctccctctc tctccctctc 60
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caartctggc tccattcctg gycwtctgtt ggtgacagac cccccctaa ggtgctcggt 180
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cctcaggacc ccacccctct gagggccagg ggagccctgt tcacgctggg ttctccccag 300
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cgggccgcca aggggactgc tgcttctttt tctaaatgca tatttttcat tatttataat 600
ttgtgtaaaa aacacacctt caccttaciaa ggtgctgacc atattaaatg ttcagggttct 660

295

ctcaaaaaaaaa aaa

673

<210> 423

<211> 2073

<212> DNA

<213> Homo sapiens

<400> 423

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ggtgccatcg gcacttccctc ccccgccctc ctcgagtgcc aagaagggtgt tggaccagcc 60
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cgcacaccac gtccctgctct ggcttttgcc ttcttgatgc cagcctgctg caacagaccc 240
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gttctagctg cgtctgcggc cagcccgctgc cagtggagtg ggctccgcgt tgctcattct 360
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aaaaaaaaaa aaaaaaaaaa aaagggcggc cgc 2073

```

<210> 424

<211> 2609

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

296

<222> (31)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2585)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2602)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2609)

<223> n equals a,t,g, or c

<400> 424

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gtctgcccag  ggggactgcg  agttcctggg  gcagcgagcc  cgggagttgg  tgccgcaaga  180
cctgtgggca  gccaaaggcg  ggctgatcac  ggccccgcagc  ctctaccggg  cagactttaa  240
catccagtat  gagatgtaca  ccatcgagcg  gaatgcagag  cggaccgcca  ccgccgggag  300
stgctgtacg  acatgtttgt  gaatttccca  gaccagccgg  tgggtgtggg  agaaatcagc  360
attattacat  cagcattaag  gaacgattca  caggacaaac  aaaccaatt  tttagaaggt  420
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ccatactgcc  tccatttaat  gttagcctgt  tttaaagctt  gagctttcac  agacaacaga  1860
gacgacatgg  cattggggca  tgtgattgtg  ttgcttcagc  aagagtggcc  acggggcgag  1920
```


297

```

aatctttttcc tgaaagctgt caataaaaatt tgccaacaag gaaattttcca atatgagaat 1980
tttttcaatt acgttacaaa tattgatatg ctggaggaat ttgcctactt gagaactcag 2040
gaaggtggga aaattcatct ggaattacta cccaatcaag gaatgctgat caagcaccac 2100
actgtaactc gaggcatac caaaggcgtg aaggaggact ttgcctggc catggagcgc 2160
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aaaacaaaag taccaatctg ttttgtaaat aaaaatcatc ctaaaatttg aaaaaaaaaa 2520
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 2580
aaaanaaaaa aagaaaaaga anaagaaan 2609

```

<210> 425

<211> 987

<212> DNA

<213> Homo sapiens

<400> 425

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agacctcatc tcttaaaaaa taaaaaataa aaagtctaag aggatacaca gaaattttta 180
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gaaaagtgag gattttaaag aagtaacccc taaactcagc cagtcccatg tttttttaac 420
acttgggaata tctaattcca tttaactgac attcttcaaa tgtaattttc aaagatgcct 480
tttgccctcat cccttgcttt taagtattat tatagacttt tggagactca cgaaacaagc 540
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agtgtatatt ctatgaaatg gaagaaacaa gaactagaca gagtcacaaa tgctgttgat 660
cacagacaat ctctgccatc cataaggtaa atgtaataca tctggcgacc tgctgagtgt 720
gaacttgtag caggtgagga aggaactctg aactctcaca atcttgtttc ttcattttccc 780
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aatgcttacc tttaatcatg tgacattggt tatcttggat taaaagaaaa gaaaatgtat 900
ttatttttgt catattttca ataaaatata taaaatcgag ttggtatata gtgccaaata 960
cattaatta aaaatatttt aacctga 987

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<210> 426

<211> 1726

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (15)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (21)

<223> n equals a,t,g, or c

298

<400> 426

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gtccccccgc atgcatgggg atttctcccc agaccagcat acttgtgacc tgagagttca 180
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caggggcata ataagtgacc agccccctct ctcgggacat cagatccaac acataaggac 420
cctggcctac cctccagccc aacagccagt tctgggtcag ctgccaaact aggggtgggt 480
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cagattcatt ccttggctcc aactgaaaag actcagtttc aatcggttaa agttccttta 600
gggccagaag aataaatgaa ttataatccc attttgaaga accgatttat aaccaatgaa 660
aaggttataa tgtaatttat attcttggag gaacaagatt ttcatttggg attatttctc 720
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gagcctgtgg tggagatcta aagatgttta gggagagct cgactaaa acaatgaa at 1680
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```

<210> 427

<211> 1528

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (22)

<223> n equals a,t,g, or c

<400> 427

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aggcctgttc tcgagaggag cgggatgcct gggcctttga gatcaccggg gctattcatg 420
cagggcagcc ggggaaggtc cagcagctgc acagcctgag aaactccttc aagctgcccc 480

```

299

```

cgcacatcag cctgcategc attgtggaca agatgcacga tagcaacacc ggaatccggt 540
caagcccca catggagcag ggaagcacct ataaaaagac ctctctcggc tctctctggt 600
ggactgggtc atctccaaca gcttcacggg cagccgtctg gaggcggtga ccctggcctc 660
catgctcata gaggagaact tcttcaggtc tgtggctgta cgatgcattg gaggcattcg 720
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aaagtaggtt ccctttgttg gaacaattac actggccatg ccataatgtt gaataaaaact 1500
ctcttcttaa aaaaaaaaaa aaaaaaaaaa . 1528

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<210> 428

<211> 2055

<212> DNA

<213> Homo sapiens

<400> 428

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aagaggacag tgatagatgc atttkcccca ggctgtctca gaaaggctcg taaatgtata 60
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tccactgtg acttattttc tctctcaggc agccagccac ctggtccctt gtgctgactc 180
tagcacagtg gccaggatcc aatacgagtc caggggtgac cgcaggatgg tgggggcagc 240
gggcttctcc acctacccca gccaccaagg scctgacgca ctgyctcctg caccttcagc 300
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aacgctgatg ataccagctc ctccctkccg tgcccctgcc acggagcagg cattgtgaac 420
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agttataata tatatttaag atgataagtt tcttgcttaa gttgtgcctt tcagcttcaa 1560

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300

tgagtttaag gagcactaag ggtaatgata ccaatgaggg ttggtttatt atcaaacctg 1620
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gttggtgtgtt ttttattatg tacatttgta tatttttttg cttgtttgat gttctatitt 1740
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aaaaaaaaaa aaat 2055

<210> 429

<211> 355

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (348)

<223> n equals a,t,g, or c

<400> 429

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<210> 430

<211> 2834

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (18)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2828)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2834)

301

<223> n equals a,t,g, or c

<400> 430

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302

<210> 431
 <211> 2709
 <212> DNA
 <213> Homo sapiens

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<220>
 <221> misc feature
 <222> (2677)
 <223> n equals a,t,g, or c

<220>
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 <222> (2691)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2699)
 <223> n equals a,t,g, or c

<400> 431
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303

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<210> 432

<211> 739

<212> DNA

<213> Homo sapiens

<400> 432

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atthgtctgc tcaaaaaaa 739

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<210> 433

<211> 853

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (734)

304

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (758)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (767)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (833)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (851)

<223> n equals a,t,g, or c

<400> 433

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gcaaccacct nat 853

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<210> 434

<211> 1098

<212> DNA

<213> Homo sapiens

<400> 434

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ccagcaccct cccctaactc caggccagac tcctttcagc taaaggggag atctggatgg 120
catctacttc gtatgactat tgcagagtgc ccatggaaga cggggataag cgctgtaagc 180
ttctgctggg gataggaatt ctggtgctcc tgatcatcgt gattctgggg gtgcccttga 240
ttatcttcac catcaaggcc aacagcgagg cctgccggga cggccttcgg gcagtgatgg 300
agtgtcgcaa tgtcaccatc ctccctgcaac aagagctgac cgaggcccag aagggccttc 360

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305

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aggatgtgga ggcccaggcc gccacctgca accacactgt gatggcccta atggcttccc 420
tggatgcaga gaaggcccaa ggacaaaaga aagtggagga gcttgaggga gagatcacta 480
cattaaacca taagcttcag gacgcgtctg cagaggtgga gcgactgaga agagaaaacc 540
aggtcttaag cgtgagaatc gccgacaaga agtactaccc cagctcccag gactccagct 600
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<210> 435

<211> 1178

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (917)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1176)

<223> n equals a,t,g, or c

<400> 435

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306

<210> 436
 <211> 686
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (364)
 <223> n equals a,t,g, or c

<400> 436
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 atataaaaga ttgtcaaact taaaaa 686

<210> 437
 <211> 2588
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (2481)
 <223> n equals a,t,g, or c

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 <222> (2505)
 <223> n equals a,t,g, or c

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 <222> (2542)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2544)
 <223> n equals a,t,g, or c

<400> 437
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307

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aaaagaca 2588

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<210> 438

<211> 3609

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

308

<222> (32)

<223> n equals a,t,g, or c

<400> 438

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gagatgaata cagctgcaga tatcttcaaa cagtatatga agtattataa tgactatgga 540
gatatcatca aagaaacaat gagtaaaaca aggcagatag acaaaattca gtgtgctaag 600
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309

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aactcatttt ggcaggetta ggcagctaga catcgtttaa aacaaaatat taacttatat 2880
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<210> 439

<211> 2643

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2630)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2633)

<223> n equals a,t,g, or c

<400> 439

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310

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aaa 2643

```

<210> 440

<211> 637

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (564)

<223> n equals a,t,g, or c

<400> 440

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caaaatattt gttatctggt cttttgttga aaaagtttag ccaggcatgg tgggtgggcgc 480
ctgtaatccc agctactcgg gagtctgagg caggagaatc gcttgaaccc gggaggtaga 540
ggttgcagtg agccgagata gtgnccatgc gctccagcct gggcaacaga gtgagactcc 600
atctcaggaa aaaaaaaaaa aaaaaaaaaa actcgta 637

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<210> 441

<211> 2595

311

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (64)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (82)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1222)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2398)

<223> n equals a,t,g, or c

<400> 441

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agggaccagt gggaggaccg gatccagggtg tggcatgcgg aacaccgtgg gatgctcaaa 180
gataatgcta tgttgggaata cctgaagatt gctcaggacc tggaaatgta tggaatcaac 240
tatttcgaga taaaaaacia gaaaggaaca gacctttggc ttggagttga tgccttggga 300
ctgaatattt atgagaaaga tgataagtta accccaaaga ttggctttcc ttggagtga 360
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atgaaggccc aggcccgga ggagaagcat cagaagcagc tggagcggca acagctggaa 600
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gaggagttga tgctgcggct gcaggactat gaggagaaga caaagaaggc agagagagag 720
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312

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```

<210> 442

<211> 1301

<212> DNA

<213> Homo sapiens

<400> 442

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ggcacgagga ctgattgccc cttgggctca tatgttggaa tcgaccaggt aggccagccc 60
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acatttgttt acctgttata gttgcaagtt gtacaggctg acattgcctc gatcgacagt 180
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<210> 443

<211> 689

<212> DNA

<213> Homo sapiens

313

<220>
 <221> misc feature
 <222> (678)
 <223> n equals a,t,g, or c

<400> 443
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<210> 444
 <211> 395
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (380)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (384)
 <223> n equals a,t,g, or c

<400> 444
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 ctggtattca gtattgcctt aataaaactt acccacaact gcaaaaaaaaaa aaaaaaaaaa 360
 aaaaaaaaaa aaaaaaaaaa ccnngggggg ggccc 395

<210> 445
 <211> 1558
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature

314

<222> (420)

<223> n equals a,t,g, or c

<400> 445

```

caataatctt aacagtgtcc tggctgarcg actggagaag tggctgcaac tgatgctgat 60
gtggcaccct cgacagaggg gcacggatcc cacgtatggg cccaatggct gcttcaaggc 120
cctggatgac atcttaaaact taaagctggg tcatatcttg aacatgggtca cgggcacccat 180
ccacacctac cctgtgacag aggatgagag tctgcagagc ttgaaggcca gaatccaaca 240
ggacacgggc atcccagagg arkaccaggm gctgctgcag gaascggggc tggcgttgat 300
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ggacatggat cttgtttttc tctttgacaa cagtaaaatc acctatgaga ctcagatctn 420
cccacggccc caacctgaaa gtgtcagctg tatccttcaa gagcccaaga ggaatctcgc 480
cttctcccar ctgargaarg tgtggggcca ggtctggsac agcatccaga ccctgaagga 540
agattgcaac cggctgcagc agggacagcg agccgccatg atgaatctcc tccgaaacaa 600
cagctgcctc tccaaaatga agaattccat ggcttccatg tctcagcagc tcaaggccaa 660
gttggatttc ttcaaaaacca gcatccagat tgacctggag aagtacagcg agcaaaccga 720
gtttgggata acatcagata aactgctgct ggccctggagg gaaatggagc aggctgtgga 780
gctctgtggg cggggagaacg aatgaaactc ctggtagaac ggatgatggc tctgcagacc 840
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agcaagggtc gtggctcctgt cagtggaaag ccggatagca tgaatgcctc tcgacttagc 1260
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aagaagagtg aagaactggt ggctgaagca cataacctct gcaccctgct agaaaatgcc 1380
atacaggaca ctgtgagggg acaagaccag agtttcacgg taacagcttg tgtgagactc 1440
ctgcgattcc atgtcctttc tttctatggc aaaatagaag agaaaatgga aatgcaatct 1500
ggcattatcc tcaaccccaa aaaaaaaaaa aaaaaaaaaa aaaaagtcgt atcgatgt 1558

```

<210> 446

<211> 3085

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (62)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3077)

<223> n equals a,t,g, or c

<400> 446

```

ttttttcctt ctactataacc attttaagtt ctgacctcag gcctccattt gggccgatgg 60
cntcttgagg gcttaaaagtt ttctgtacct tgtgatgaat gttaataggt gtttttatta 120
tacaaagctg aatgtcattt ctggtttgta gctttctgtc actcattcca tcttccttca 180
gacatcacca cgtttctcta aagtcagaaa acattccgtt ttggtctttt tcaaaaagggt 240

```

315

```

cccaaatgct gcactctaca catgaaggcc ctctcacaca gacgtgacgt cctgccagaa 300
agagaatgaa tgacagaaaa aaaaaagaga gacaaactct aggaacaatg ccgattcatt 360
ccacgcagca gtattggggg tggttcgggg gaggggtgtt tcggattttc ttttttytt 420
ttcttttmtt tttttttttt tgcagcaacc attaataaat gccaccacat tctaccagca 480
caaggaaaca taggcagcac tgaaaaaaaa aaaaaaagct catattaatt agactgacaa 540
tatggccttg gaaggctctc ccttgtggaa ccaagttgcc atgggccttg ggtgctctgc 600
gataacgggt gtgggttggg tttgtttgca aaatggccaa aaaaaaaaaac cggcttcccc 660
gagcagctgc cctgaaagta ggggtggcgg cggcggcgct gagtttatac attagttcag 720
acctacttgg tggcattaaa ctgtttgaat gcaaattcga tttcagattg aacttgtaa 780
gggagttaac gagggctgag ttcagcaaat gctaaagtgt taatttcaaa tatgcaaatt 840
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aagatatcat gtaggccttg ggctttgggg gggtcccaaa catggtatgc agaaatgtga 960
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taaaggagct acagaaggaa gggagtccca tctcaaaaa aaaatgaatg tatgccactg 1500
caattagagt atccaataaa ggagacagtt tagagtcagg acagaaaagc ttccataatt 1560
gaactagatt acataatagt atttctagaa aaagagatat ttttagattg tatgccactt 1620
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cagttacttt tgaagcttca ctctgctttc tgtataaagg gcagtctgtg gtcacgcaag 1860
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catgatgtgc aggcagtagc cagacagggt catgggaagg gggccctgtg cttctaaact 1980
gagtgggtgc tggttagttt ggtattcaaa agaggataaa aatctggtag attagttcat 2040
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tctgtctgca gtaaatatth tgcatgatga aattccaggg tcacacttht ccaagthttat 3000
cagtgaagta gtgattaaca atggggagtg tcaaaactat tgaactthtg tataaaaaaa 3060
aaaaaactth acaaggngcc aagat 3085

```

<210> 447

<211> 1917

316

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1915)

<223> n equals a,t,g, or c

<400> 447

```

ccttaatccc gagacgtccc gttaaaacgc cccgtctgga agcgggtttcc cactttgaat 60
tacgaagtgc aagcatttgc gagcagccat gattccccggc gcacgcagcc gtcacgcgca 120
ccgtacagcc cagtccacga agggcgccac gggccgtgac gtcacctatg cccgacggcg 180
cgcttttcgtg acgcagccccg ggtctcaggg aacatggcgg cgctggtgag acccgcgagg 240
tttgctcgtgc gaccgttgct gcaggtgggc caggtctggg accttgacgc gaggcgctgg 300
gtccggggcgc tgcggcggag ccagtgaaag tgggtgtttcc ttccgragag gtggtggaac 360
agaagcgcgc tcctgggaag cagccccgca aggcaccatc tgaggccagt gccaggagc 420
aacgagagaa acaaccgctc gaggagtcgc catcccgccg tcccagcacc tgggaagagt 480
ctgggcttcg ctacgataaa gcttatcccc gggacaggag gctgagcagt gtaatgacaa 540
tagtaaagtc caggccattt cgggaaaaac aagggaagat cctgctggaa ggtcgcaggc 600
tcatttcaga cgctctcaag gctggagctg tgccaaaaat gttcttcttt agccgtctag 660
aatacctaaa ggagttgcca gtcgataagc tgaaagggtgt cagcctcatt aagggtgaaat 720
ttgaggatat caaggattgg tccgacctcg taacgccaca aggaataatg gggatttttg 780
ccaagcctga ccatgttaag atgacatata caaagactca gcttcagcat tcaactgcct 840
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cagctggggc aggtctgcagc aaagtgttac tcaccaaaagg ctgtgtggat gcctggggagc 960
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cggcagctgt ggtgattggc ggggagacct acggcgtgag ctggagtccc tgcagctggc 1320
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aagaagcact ttgtgcccag aaagtccctg aagcatcatc ctggcaggga ggcgcctgct 1800
ccaccagctg gtgggtgttt gtaatcgcca agcaccagct ataggtcaca gccacatcac 1860
tcacagctga tcactggttg gtggaaaata aactatgagc agcaaaaact cgtgncc 1917

```

<210> 448

<211> 946

<212> DNA

<213> Homo sapiens

<400> 448

```

ggcacgagcg gcacgagtcg gcacgagaac actgctatgg gcgttggtcc atgatcaaac 60
ggctggcatg actcatcata gtcacgaaca gttattagcc agccatggct gtggttgctt 120
gccttagcag tcctgtgtta gcattgcttt actctgggca ctttttctt attctctatt 180

```

317

```

ctgggataga agtagtttct gacttctagc cacgttcagt ccaggctgga gagatctaca 240
cctgttttcta ggattctcgt tttcaagggt tctgaatatc ccctactccc acttaccccc 300
aaaataagct ttttacckgg ataggagagg gaaagaggta tttttcatca attctccctt 360
tctctgctct tctccctttc taataccata aggcagttct tcgtgacttt tacagaaaca 420
tatgtacacg tccttacaga gtttaggaga gcctgtgggc tttttgcctt agtctgctag 480
aaagactggc ctgctgctct ctgctttatc cagaggtctg cctctgggac ttcagccctg 540
tagctgtaga gaccagaaga ccaaccctct ttgagacca gatgctactt tcccttgctg 600
ccccctctct ttccctctccc aatgagccaa cctttttgcac ttccactaga atgccaggca 660
ggctgggccc ccaaaggctc ctttttcaaa acctctggaa gccgcggttg aatgtgccat 720
gacctctctc ctctctggat ggcaccatca ttgaagctgg cgtcatcgga gtctcttggt 780
ctgttggcgt gctacctgga agatccttct gtccctggaca agaggaattg gaagagcatt 840
ttatgtttta agaacaggct gacacgcagc agctacaaca acagctgaga tcacttaata 900
aatggtgcta aactaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaa 946

```

<210> 449

<211> 1190

<212> DNA

<213> Homo sapiens

<400> 449

```

ggttctagct aaatataagt gcgactgtaa acgcagccaa tttttttaag cagaatatga 60
gaacacctaa gtattctctt catagcagtt cctataaagg gattaaacac ttatttctgt 120
gttatggttc ttattcatat atttttatag cacctttttt tggaacctat atttgtgctt 180
gaagggtgtt ttgatatttg gaaacagtat aagccatttg gagtcatgat tgggtgtcaa 240
gtggattcaa gctaaaatac taagaccagc attcttagtg gcgcttataa attagctctc 300
acctggtttc caaactgctt ttaacaatgg tagtgctcct ggaacaatcc ttccaagctc 360
ctctaaggac aatattttaat tcagatacta aaggtaagac tggttgttac ttttgttttg 420
ttgtacaatt agtactttat agtcacatgt tgtatatatt aaatagccca gttttattca 480
gacttgtaaa tagaactatt tcaatgtagt taatctaaaa acaaaaaaga aaacccagct 540
cacgatttgc atgttctctg taagcttcat ccatgctggg tattgcactg aatgatrtat 600
tattagggca tgttaacagt ataccagtaa cagcacttta tctcatttat atgaacacct 660
ttgaggtgct acttaagtc cagctctgat gtattattca tttgtaaaga taaggtagac 720
gaatgaacct tggtttaaaag gtatttttat atgaaaatgg tgtgttattg gaagatgtta 780
aaatgcta at ttgagagaag taggagtgt tctgttttat atgttgggat gtgaaattta 840
ttttctaaaa ttgaggagaa ggaagttata tatttgcaga atgttttaaa gtgaattgtt 900
gtaatgaagt tcctgtgaac atcattatgg ttttgtacaa ataggaacct ctgatgtcat 960
tcttcaacgt ttgttcctgt gtgtacaatt gtactttgta tgaacagctt tatcattttt 1020
ataggctttc catgagtttt gctgtaacta ctatggctta tttattttct ttaatatattg 1080
tgaaagtctt actcctttgt tagttttgtt tctgcacaac tactgtactt ttccatatgg 1140
aataaagact attaatagaa aaaaaaaaaa aaaaaactcg agactagcct 1190

```

<210> 450

<211> 915

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (915)

<223> n equals a,t,g, or c

318

<400> 450

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gggtcgcaccc acgcgtccgc ccacgctccg cccacgcgtc cgagactatc tttctagaca 60
aggcagttga ggaggaggga gcgcttgagg gggactggcc tggcgtgcac tccgcacctc 120
ggggacatta ttgcgcgtgg aacggctgct tttggaagac tattgccag aagaaaagat 180
gtttggtttt cacaagccaa agatgtaccg aagtatagag ggctgctgta tttgcagagc 240
taagtcctcc agttctcgat tctactgacag taaacgctat gaaaaggact tccagagctg 300
ttttggattg catgagactc gttcaggaga catctgcaat gcctgtgtcc tgcttgtgaa 360
aagatggaag aagttgccag caggatcaaa aaaaaactgg aatcatgtgg tagatgcaag 420
ggctggaccc agtctaaaga ctacattgaa accaaaagaaa gtgaaaactc tatctgggaa 480
caggataaaa agcaaccaga tcagtaaaact gcagaaggaa tttaaacgtc ataattctga 540
tgctcacagt accacctcaa gtgcctcccc agctcaatct ccttgttaca gtaaccagtc 600
agatgacggc tcagatacag agatggcttc tggttctaac agaaccacag ttttttcctt 660
tttagatctc acttactgga aaagacagaa gatatgttgt gggatcatct ataaaggccg 720
ttttggggaa gtcctcattg acacacatct cttcaagcct tgctgcagca ataagaaagc 780
agctgctgag aagccagagg agcagggggc agagcctctg cccatctcca ctcaggagtg 840
gtgactgagg tttttatgta gaaggggaac aaaaaaaaaa awctgaattt tgaaaaccac 900
aaagstacaa aatgn 915

```

<210> 451

<211> 1862

<212> DNA

<213> Homo sapiens

<400> 451

```

ggcacgagct cgtgccgaat tcggcaccaa atttctgaag cattaatctg ttctgttact 60
ttccagctaa aaaccaacaa gtgtctgagg acacagttta aactccaaga tgatagggtc 120
cggcacgagt gggctcccac ctacctcat gacctcctt tgtgaaatgc tgaagggctc 180
tgcagctggg tgtctggtac tgctggcctt tgctttctat ttagcatgtt ccttctccca 240
caaaacaaaa tcacattctc actatgcctt gttcattctt caggactatc ttctgggaaa 300
cttttactac atacctctc cccctaate tgagtgtctg ctttgtctag gtagcatgtg 360
ttcactggat aaatccttga ttctggcac tgaggcaggg tttctgttcc caggaagcag 420
aggcatacta ttctgtgaag gattgactga gtttctccta ataccaagca gtatctgagg 480
gaacagatgt ctagcttaaa atcctcccta gcacttgtca tagcagtgtc acgtattgcc 540
tgtgaaggaa gtttaataac tgctgaaagg ttcgattagc tttatttcat caggatttgt 600
tgactttac aaattgattt gggttatttc aacttttagg tctagtctta agtataactg 660
gtacatattc cttcaagcag ccattacacc tctcataaat ttattataca cctgcatttt 720
tataactatt atgcttttta attgttggcc accattttta gtgcttctga attgttatgg 780
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atgttaagta ttgttccttg ttatgtaaaa ggggttgaag tgattctaat ttgttttcaa 1560
ggttagttta atagattgga agaataattg gccgcctcat cggtccctt ttcattttgt 1620

```

319

```

acagtatcaa ggtataggaa ttttactgta ttgactttt tttctctctc ttccagtgac 1680
aatcatagga ggcacggtt ttttggcgtt tgcattttct gcactattta taagccctga 1740
ttctgggttt taacaagctg ttgtttcatc tatatttagt ttaaaatagg tagtattatc 1800
tttctgtaca tagtgtacat tacaactaaa agtgatggaa aaataaaaaa aaaaaaaaaa 1860
aa 1862

```

```

<210> 452
<211> 800
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (303)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (756)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (794)
<223> n equals a,t,g, or c

```

```

<400> 452
gcttccagca ggaa5tgagtg ctaaaatgct gggaggtgtc tttaaaattg actggatttg 60
caggcgtgaa ttacccttca ctaagtcggc tcatctcacc aatccttgga atgaacataa 120
accagtaaag atcggacgtg atggacagga aattgaactt gaatgtggaa cccagctttg 180
tcttctgttt ccccccgatg aaagtattga cttgtatcag gtcattcata aaatgcgtca 240
caagagaaga atgcattctc agccccgatc acgaggacgt ccatcccgcg agaaccagtc 300
cgngawgk9g gaaggcgtcg accagaagat tatgatattc ataacagcag aaagaaacca 360
aggattgact atccccctga gtttcaccag agaccagggt atttaaagga tccacgatac 420
caggaagtgg acagacgatt ttcaggagtt cgccgagatg tgtttttaaa tgggtcctac 480
aatgattatg tgagggaatt tcataacatg ggaccaccac caccttggca aggaatgccc 540
ccttacc1cag gaatggaa1ca acctccacac catccttact atcagcacca tgctccacct 600
cctcaagctc atcccccttt acttcaggga catcatccag ttaccacatg gaagcaagg1t 660
tacagagatw aaacggagtt acatggatta tgatwttgag ggggtgggatg gatttttcctt 720
tcgttcggca cacaagg1ttg ttgtttcagt gggccnggag aagttaggac ccccg1tgaaa 780
aggaggaccc ggg1nacgggg 800

```

```

<210> 453
<211> 2106
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (2093)
<223> n equals a,t,g, or c

```

320

<220>
<221> misc feature
<222> (2094)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2096)
<223> n equals a,t,g, or c

<400> 453
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<210> 454
<211> 2288

321

<212> DNA

<213> Homo sapiens

<400> 454

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<210> 455

<211> 2361

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

322

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2260)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2288)

<223> n equals a,t,g, or c

<400> 455

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323

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<210> 456

<211> 957

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (26)

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<220>

<221> misc feature

<222> (32)

<223> n equals a,t,g, or c

<220>

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<222> (41)

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<222> (47)

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<221> misc feature

<222> (49)

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<221> misc feature

<222> (50)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (61)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (64)

<223> n equals a,t,g, or c

<220>

<221> misc feature

324

<222> (67)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (70)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (73)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (75)

<223> n equals a,t,g, or c

<400> 456

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<210> 457

<211> 923

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (886)

<223> n equals a,t,g, or c

<400> 457

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ctctcggccg cactcgcgct gtacgggccg ccaactggacg cagttttaga aagagcgttt 180
tcgctacgta aagcacattc gataaaggat atggaaaata ctttgcagct ggtgagaaat 240

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325

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atcatacctc ctctgtcttc cacaaagcac aaagggcaag atggaagaat aggcgtagtt 300
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gccctatgga cagcgatgac agccatggat ctgtgctaag actcagccaa gccctgggca 780
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cctgggcgctc ctggtacact ggg                                     923
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<210> 458

<211> 3058

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (14)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (15)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (24)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (27)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (418)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3045)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3053)

326

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3056)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3057)

<223> n equals a,t,g, or c

<400> 458

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gaagtgtcac atttaatatc agtttttttt aaacatgatt ctagttaaat gtagaagaga 2220
gaagaaagag gaagtgttca cttttttaat acactgattt agaaatttga tgtcttata 2280

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327

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<210> 459

<211> 555

<212> DNA

<213> Homo sapiens

<400> 459

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cycacattgt taggtgctga cctagacaga ratgaactga ggtccttggt ttgttttggt 180
catatacaaa ggtgctaatt aatagtattt cagatacttg aagaatgttg atggtgctag 240
aagaatttga gaagaaatac tcctgtattg agttgtatcg tgtggtgtat tttttaaaaa 300
atttgattta gcattcatat tttccatctt attcccaatt aaaagtatgc agattatttg 360
cccaaagttg tcctcttctt cagattcagc atttgttctt tgccagtctc attttcatct 420
tcttccatgg ttccacagaa gctttgtttc ttgggcaagc agaaaaatta aattgtacct 480
attttgtata tgtgagatgt ttaaataaat tgtgaaaaaa atgaaataaa gcatgttttg 540
ttttccaaaa aaaaaa 555

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<210> 460

<211> 612

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (595)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (599)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (600)

<223> n equals a,t,g, or c

328

<220>
 <221> misc feature
 <222> (606)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (612)
 <223> n equals a,t,g, or c

<400> 460
 ggccactcag agtgggtgtc ttgtgtccgc ttctcgccca acagcagcaa ccctatcatc 60
 gtctcctgtg gctgggacaa gctgggtcaag gtatggaacc tggctaactg caagctgaag 120
 accaaccaca ttggccacac aggctatctg aacacggtga ctgtctctcc agatggatcc 180
 ctctgtgctt ctggaggcaa ggatggccag gccatgttat gggatctcaa cgaaggcaaa 240
 cacctttaca cgctagatgg tggggacatc atcaacgccc tgtgcttcag ccctaaccgc 300
 tactggctgt gtgctgccac aggccccagc atcaagatct gggatttaga gggaaagatc 360
 attgtagatg aactgaagca agaagttatc agtaccagca gcaaggcaga accaccccag 420
 tgcacctccc tggcctggtc tgctgatggc cagactctgt ttgctggcta cacggacaac 480
 ctggtgcgat ktggcagtga ccattggaca cgctagaagt tatggcagac ttacaaataa 540
 aaaaaaactg gctttttgaa aaaaaaaaaa aaaggcggcc gtttaaagac caacntacnn 600
 ccctgnttca an 612

<210> 461
 <211> 882
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (852)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (877)
 <223> n equals a,t,g, or c

<400> 461
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 gaagagatca tcaattatga aatttgaaca ccaagggacc tgggtgtgcct gggcctgagc 120
 agcatcgttg gcgtctggta cctgctgagg aagcactgga ttgccaacaa ccttttttggc 180
 ctggccttct cccttaatgg agtagagctc ctgcacctca acaatgtcag cactggctgc 240
 atcctgctgg gcggactctt catctacgat gtcttctggg tatttggcac caatgtgatg 300
 gtgacagtgg ccaagtcctt cgaggcacca ataaaattgg tgtttcccca ggatctgctg 360
 gagaaaggcc tcgaagcaaa caactttgcc atgctgggac ttggagatgt cgtcattcca 420
 gggatcttca ttgccttgct gctgcgcttt gacatcagct tgaagaagaa taccacacc 480
 tactttctaca ccagctttgc agcctacatc ttcggcctgg gccttaccat cttcatcatg 540
 cacatcttca agcatgctca gttatgagga gtcaaatcct aaggatccag cggcagtgac 600
 agaatccaaa gagggaaacag aggcattcagc atcgaagggg ctggagaaga aagagaaatg 660
 atgcagctgg tgcccgagcc tctcagggcc agaccagaca gatgggggct gggcccacac 720

329

```

aggcgtgcac cggtagagggc acaggagggcc aaggcakctc caggacargg cagggggcag 780
caggatacct ccagccaggc ctctgtggcc tctgttttcc ttctcccttt cttggccctc 840
ctctgctect cnccacaccc tgcaggcaaa agaaaanccc ca 882

```

```

<210> 462
<211> 733
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc feature
<222> (640)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (660)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (677)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (687)
<223> n equals a,t,g, or c

```

```

<220>
<221> misc feature
<222> (711)
<223> n equals a,t,g, or c

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<400> 462
tccccatggg tctcctacct aaatgattgg ttccctatg gctatttctc caagagttaa 60
gggatatgctg cttaactatg cacctttaca gaacattctt agcagtaatg ctcaaattta 120
aaaggcacac tcaagatact tccatgtcat ggatccttcc ccagggtcca gtartataaa 180
tatagggaag aggttagcat gaacttacwa attgttttaa gtaatcctct tgaatgccag 240
tcattaaagg actttgccc tctacatcaa attacatcct ttccacaaat ccccatttct 300
gtaataactg gtgcaaacct aaagggtgctt tatagtttta ctactttgca gatttgcaat 360
gctgcatata atgcagaaga gcattaaaaa cttttgtaaa aactcatgat tttgataaac 420
ttttaaagta gcgtttatat gtaaatagaa ctacacatgg gcacacacac ttgcacargg 480
gcttcagaaa aacgtgcaat atagggtgagg aaaaatgtct attgaaactt tctcacaggc 540
tgcccttatt aattaaaact agtggtgggg gcaagcaaca tctgtttcca agtaggttca 600
ggggactagg caaaccttaa agggcggcag gcggcctgcn gtttgcttca ttccttaggn 660
ttactgggtt cctacanctg gttttanttg tcttaggtgt ggactttgga nggtacagtg 720
tttgtggctt ttt 733

```

```

<210> 463
<211> 574

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330

<212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (1)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (18)
 <223> n equals a,t,g, or c

<400> 463
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 gcagggaggg gagccttctg gaagggctgc cttggagatt ggaatgggga ctcccaggga 120
 gacctgcgtt ccatccctgc ctgcctcacc cctgccacag actctgcaca ccaactggatg 180
 gtgggtccaa gcctggcaca gtccctgtgc ttgtcagagt cattattatg attaatatca 240
 attacgatgc caaaaattgc tgggcaaact ttgaagacct caacttgta caatgacgat 300
 gatgatgatt cttggcgggtt acacaatcct tcctcctggg ggggaggcag ctaggaggcc 360
 cagcaggggg gcttctatgc tgctgggctc ccctagggag ttggggtagt ctgtgccaac 420
 tccaggcagc tgctgtggcc tcacccctgg gcccccaat tttgggtcat ccctcctcaa 480
 atacactatt tttgcttgta tgctgtgtc atttgttggg tgtacagagg ggatataggg 540
 agagtggtag gcttcccaca cagaaactag gaca 574

<210> 464
 <211> 691
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (5)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (7)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (9)
 <223> n equals a,t,g, or c

<400> 464
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 ttcttaggt tgcactagtc gggggttcca tgctgggggg cagaaggaat gctctctacc 120
 gtctgaaacc gttcatcagg aaggccttga tttgtgatgt gctaggagag cacaggatct 180
 gcaaataagaa ggcacctgtc tcccttctgc aggccgagga gaggccgcca tggactgtgt 240
 gcttcttcat ggcttgttta ctcttcttct acagacccta cagcttgggg cctgggctcc 300

331

tctgaccatc ctcattgaga aaggaaagtg agtccagaga agttgatgct tcctacctgt 360
tggagcgggc cagcagtgtg agcgtgggtg ttactgcccc atccgccatg tccttcagtg 420
ccaccattct cttctcccc cccagtggca gcgaggccag atgctgctgc tgcgcctgta 480
agagtggagc taatggaggc aacacaggct cccaggggtg gaatcctcct cccagcacc 540
ccatcacagt gactggacat ggcttggctg ttcagagctc agagcagctc ctgcatgtta 600
tctaccagcg ggctgataag gcagtgggtt tggctgaagc tgctctgggt cttgccaggg 660
ccaacaatga gttgttaaaa cgtcttcagg g 691

<210> 465

<211> 260

<212> DNA

<213> Homo sapiens

<400> 465

atgagtcaca tttattgatt tgcattwtgtt gaatcaacct tgcattcctgg ggacaaagcc 60
aactccattg ttgcratga actttttaat rtgctgctgg atttggttg ccagtatttt 120
attgaggatt tttgcacagt gtttaccaaa gacattggca tgatgtgttg ttgttgttgt 180
tgttgttgtg gtatctatga taggttttgg tatctggatg atgctggcct gataggaatg 240
agttagagag aacttcctta 260

<210> 466

<211> 851

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (584)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (727)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (755)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (761)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (793)

<223> n equals a,t,g, or c

<220>

332

<221> misc feature
 <222> (825)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (842)
 <223> n equals a,t,g, or c

<400> 466
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 gcttttctagt cctttaactc ctagaggcaa acttttgggg gataagaaag cctgggaggg 120
 gcctgtgccaa aaacctctc tgctgggga ctgggcggtg attccgcttc tgctgggct 180
 cctgccatgg ccccgagag gggctgacac tttagctccc ggtgcagggtg agaaccgcc 240
 cggaggaaga aggaaggcgc gggccgggga ttaggagacg gaggcggact cggagccagg 300
 gaaccagggg tccgggctag agctggagtc gtgagcgcgc gcccgccccg ctctgggagg 360
 accgcgagat gccgtgctg aagcagctgg gccccgcgca gcccaagaag cggcctgatc 420
 gcggcgccct gtccatctcc gcgcgcctcg gcgacttcg gcacacgctg cacgtggggc 480
 gcggcgccga cgcttcggg gacacctcgt tcctgagccg ccacggcggc gggccgcccc 540
 cgagcccccg gcgcccccg cgggggcccc gckctccccg ccgncgcgc cgteccagct 600
 ccgcagcgcc tcgctgcga cccgctgtgc cttcacctgg atctggggcc tcctgctgga 660
 cgcggtgctg gcgtatggac gcggcgcgcc gaagcggctg cgcaagccac gcgaaccgc 720
 ccggacnagc cccagccgtg cgccacgcga ctcantacac natggcttag tctatccggc 780
 tccgccgacc atntgtctaa cgcagggggc gaaaaaaaaa aactngggcc gaccatcgct 840
 tnggcatcat t 851

<210> 467
 <211> 503
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (498)
 <223> n equals a,t,g, or c

<400> 467
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 ttgagtgccaa gctacagacc cataacagca agatggtgac cttccgattt gatctggatg 120
 gggacagccc ggaagagatt gcagctgccaa tggatatataa cgagttcatt ctgccttcgg 180
 agcgagatgg atttctcaga cggattcggg agattatcca gcgagtggag accctgttga 240
 agagagacac tggcccatg gaggtgctg aagacaccct aagccccag gaggagccag 300
 caccattacc tgccctgccc gtccccctcc cagaccctac caatgaagag ctccagagca 360
 gcacctccct ggagcacagg agctggacag ccttctccac ctccctcatt ctttcttcct 420
 gggaactcct ttgtctcctg ggaaacccat tttcccttgg aacccccatt ttccccaggg 480
 tcccatkttt ccccatcnat ttt 503

<210> 468
 <211> 1905
 <212> DNA
 <213> Homo sapiens

333

<220>
<221> misc feature
<222> (933)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (940)
<223> n equals a,t,g, or c

<400> 468
ggcacaggac cagtggagtg agctgttcat ggatgcgcta gggcccttca acttcgtgct 60
ggtgagttcg gtgaggatgc aggggtgtcat cctgctgctg ttccgccaagt actaccacct 120
gcccttcctg cgagacgtgc agaccgactg cacgcgcact ggccctgggag gctactgggg 180
taacaagggt ggcgtgagcg tgcgcctggc ggccttcggg cacatgctct gcttcctgaa 240
ctgccacttg cctgcgcata tggacaaggc ggagcagcgc aaagacaact tccagaccat 300
cctcagcctc cagcagttcc aaggggccggg cgcacagggc atcctggatc atgacctcgt 360
gttctggttc ggggacctga acttccgcat tgagagctat gacctgcact ttgtcaagtt 420
tgccatcgac agtgaccagc tccatcagct ctggggagaag gaccagctca acatggccaa 480
gaacacctgg cccattctga agggctttca ggagggggccc ctcaacttcg ctcccacctt 540
caagtttgat gtgggtacca acaaatacga taccagtgc aagaaacgga agccagcttg 600
gacagaccgt atcctatgga aggtcaaggc tccaggtggg ggtcccagcc cctcaggacg 660
gaagagccac cgactccagg tgacgcagca cagctaccgc agccacatgg aatacacagt 720
cagcgaccac aagcctgtgg ytggccagtt cctcctgcag tttgcctttc agggacgaca 780
tgccactggg gcggctggag gtgggcagat gagtgggtgc ggcccagca ggcggtgggtg 840
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ggtgggtttc cgccattgca aggactatgt ggnnttatgt tggggccaaac atgaagatgt 960
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ccgccgctg tcccagtggt ctctgacag gagcagtaat ggcagcagcc ggggcagtag 1380
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cctgggcctg ttgcccgcct tgcgcctaga gactgtagac cctgggtggtg gtggctcctg 1500
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ccaccattct gcctcaatct tttgcaagcc cacctgcctc tctcctgctg ctccctccagc 1680
tgtatctgca cctgcctctc tgtcctggcc aggggtggac aactggggtc ccccaaaact 1740
cagtctggc acctcaactg tgacaatcag caaagcccca cccaggcccc catctgggat 1800
gatgggagag ctctggcaga tgtcccaatc ctggaggtca tccattagga attaaattct 1860
ccagcctcaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaa 1905

<210> 469
<211> 775
<212> DNA
<213> Homo sapiens

<400> 469

334

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ggaagaaagt acactaacac ttctaggagc ctcttctcag aattgtagtt attccaaaat 60
agcaaatagt tggcataaag ggaaggatta tgtcagcaaa acctttttta aaatccttat 120
ttgattaatg atggtaaaaa ctaaaaaaaaa acagagtttt ctattaaaat agcctatggc 180
cttggttaag acagctatcc tagtaagatt atcttatttt ctatttatag acacatccac 240
tyaaactgca tttttatcca gcgttgatct tcacactcac tgttcctatc aactcatggt 300
gccagaggcc attgccattg tttgctcacc aaagcataaa gacactggca tcttcagggt 360
caccaatgct ggcattgctt aggtttctgc ttgtaaaaaa aagggttttc atccacacac 420
caaggagccc aggtgtttca gtatatgcaa acatgtgttg gtaaaagaca taaaaataat 480
tgtgttggtat ctgaggtgat atgttctgaa tgtaagcacc gtcaacatca gacacctact 540
catggacatg tgggtgccgg attttcttaa gatgtttcca gaaatgactg atattttata 600
tttatacatt ttagatgaca aagcttgata tttattgctg ttgcacattt taaagttttc 660
tttttgggtt gctctgtgtc aagagagggt acatggtgtt aaatcgggtac ctgataatgt 720
acccaaatac tatggccaga taataaattg tgctgcaam aaaaaaaaaa aaaaa 775

```

<210> 470

<211> 1297

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (5)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (26)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (31)

<223> n equals a,t,g, or c

<400> 470

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gcaagggtat tcttccaata ggaaacctga tgtttctgat tttaaagagaa ggtgatattt 180
taattgtttg aattaagctc cttgcaaagt tcgggtgtgt ttacccactt agggctttct 240
ttccagtcac acgctaacac attttgttaa atgatccctt tccctgctca cattgtgtgt 300
catttctcat catcagtagt cctccagcct gggcagctgt cccacacctt tttcatgtag 360
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agtgcattct gctcatatga attattggga ttgttgatat atattgtatt atgctaccaa 480
agaaatattg gttttattag aaggaaatgg tcatcctctg gaccatggag actagctcag 540
aatacgtctg tttccctctc ctgactttgc caagcctttg gctgcttttg cctgataaaag 600
ggcagggccca tctgaagaca cttccccccag tcgggttttg agtcacggga gctagtgcct 660
gtcacacat ttttcaaaaag ggcagtgcac tcagaacttc actgtacctg ggatttttaa 720
ttcctcttgc agtgttgacc agcagagaga cttgaggcta ctttaagcct ccatatgtgt 780
ttttagata aaattctcca ttcaaacatt ttaaaggact ttgaacatta tctgcttatg 840
gaagtgtgtc ccttcaactg gttagtaacc acctcagcca taatacttac catcataggt 900
ttcttaaaat gctttttttt tttccctaaa cttgagtttc cttagtgatt tcaaaatgaa 960

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335

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gtataagaat atcagatcca gttagcaaaa gcctaggact tgtttctcca aacattgtac 1020
taacattcaa cttgttttaa aattatgact caagaatttt aaaaaattat tctggacatg 1080
aattaaaact tttttataat ataagtattt ttctgattga aaaaaggata taattgactt 1140
cactctaatt gtcatgtata ttcccataag taaatggatt ttgaagtatt tttatttttt 1200
gaactttatt taaagcattt gtgatgacat gttcaacttt tgcattgtatg tagcctttga 1260
agtaaaaata aataggaatg ttaggctcac gttaaaa 1297

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<210> 471

<211> 2155

<212> DNA

<213> Homo sapiens

<400> 471

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aatatagtaa tttttaaaatt tgtaataat gaaaaccctt aagcatgcag gatgaggtat 60
ttgggttttt tttttagatc gatcacatct acagaaaatg gctaaaccaa gttactttt 120
attatagaca gtgaataaaa caccaaaaac caaaaaatgc ttaaccaca gtataaataa 180
tagattatac acatcatctt aataactatt ttaagttat ttaccatagc ctctgtatag 240
accttaggaa cagtgtttca gtgatctggc accagtttat tttgttctgc tgaaattctg 300
tatcacaat gtgctacctg gtttttgtcc attagataat tactctttat aaggaaagga 360
aagagaagca gagttagttc cagctctaata agggatcttc aaagtatttt tgtcttgatg 420
tatgtaacag taattcttta catcttttga tttttctctt cctttttatt cactcttccc 480
acgaatttaa atgtttaagt tatattcatc actagcaagg atgrtaaaca cttgtgcaact 540
gaaagctaac agggagagggg tacacaatat ttacagktt cttaaacata atttartgca 600
tcaccttcca cttgctaaca taccaagtca gttattttca agggaagaac cttttaaaatt 660
atggctcctc atttactact tccactgaga gtatgctctc attcctcagg tgttttgaga 720
aacatgacta ataaccacac aattaagtag agtcattcca agtcctatgg cctggaaatt 780
gtattcccta taatatacaa attttccctgt aataaagtca acttagaaac tccaaggagg 840
ttacatgttt tccaacatat cctaaaaact gtgatataag ctaacatata atttgcctta 900
cgtcaaaaga atatgttttg ttgcagctga ttccagttta taatagatcc ctagtaaaaa 960
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caaattcaga gaaagaaaaac agattacctg aattcatgga aaaggtggat cacctccctt 1140
tttccacctt caagcctttc ctgtcctcat agccagcatg acttctttta acttggattc 1200
ctttgtatat agtaaagttt agtatatata tatttttttc tttttgtac tttctgaggc 1260
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aacaacttaa cacccttttg tgaagatcac agcatttatc taagaaactg tgaggctttc 1500
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atgtataaatt gccaatgtat tgtaactatt atttattttt aaatgaaagt gtaagaatgc 1860
tttctgattc aacaaatttg ttatcaaaact gtttccttat cctcttttct gatgtagcat 1920
aaaaattgtc ccggttttgag ttataactgc cagtagatga ccagtcacaa gtgaaccact 1980
tctcagttgc caatctttgc tcatattaaa aacaacttac aaatacttag tttttgtatc 2040
taatctctga ttattaaaat gtttataaaag tttattttta ccaaagagat gcaattcatt 2100
atgagaaagt attgcataat aaattttgtt ttataacttt aaaacctgtg ccgaa 2155

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<210> 472

336

<211> 459
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (368)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (416)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (437)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (447)
 <223> n equals a,t,g, or c

<400> 472
 gcgagatgc agctcaaggg gaagaaaggt ggtgcggggcc tgcggggcggg acagaggggg 60
 ccggtaaactt gtggagggggc ggcctgacaa aggccggggcg cggaggggacc gtgcgaggag 120
 cagtgaattga wctgccgtcc aatcccagct ctgccgtga ctagttttga aacctgtaga 180
 aaggctccgt gtctgcttta attaccggtc cccccaggat tgtttcaaga attcagtagc 240
 tgaggctggg agtggtggct ttgtaatccc agcgctttgg gaggcctggg cgggaggatc 300
 gcttgagccc gagaccggcc tgggtgacat ggtgagatct cgtctctaga ggaatgcaaa 360
 gggtggcncg ggcgtggtgg cgcacgcctg tggtcccggc tgcttggggcg gctggngtgg 420
 gaggattgct tgacccngga ggtcaanggc tgcactgca 459

<210> 473
 <211> 710
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (65)
 <223> n equals a,t,g, or c

<400> 473
 cctcgtcata ttctaagata tccctaagaa attcttcaaa agtaacggaa tcagcatctg 60
 tgatncaatc ccaggatgtg agtgggtctg aagatacatt cccaaataaa cgacctaggc 120
 tagaagataa gactgttttt gacaattttt ttatcaagaa agagcaaata aaaagcagtg 180
 gtaatgatcc aaagtatagt acaaccacag ctcagaattc cagcagttca tccagtcaga 240
 gcaaaatggg taattgcca gtttgtcaga atgaagttct ggagtctcag attaatgagc 300
 acttgggactg gtgccttgaa ggtgacagca tcaaagtcma aagcgargaa agtctttgaa 360

337

```

aaagggtttca aagtctcaag taccacctgt attatctcac taatgtgcta tgtcagccag 420
tcaggaagtt ctgggtaata ctaagatttg taggttataa tctagttcac ataaccaata 480
gaaagtgtcc tattttatat atacgcataa aagattgtaa ttttaagatg ttttgtgtct 540
caggggtgcta cattcactct tgccttaggt atactgtaac ccagggtctg cctgtcgtgt 600
ataattttta gatacttttg ttctttcttg ctcttaagga ttttaaaaac ctgktaatct 660
ttttatttgt atactttcct aaaaatattc atatggggaa tcctgtcaaa 710

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<210> 474

<211> 1279

<212> DNA

<213> Homo sapiens

<400> 474

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gcccacgcgt ccgccgcaag ccaacagggg tgtcgtgcgg tgggagtact tccgcctgcg 60
tcctctgcgg ttcagggccc ctgcactgag gctgcagaag tcccagtcac ctgatctgct 120
ggaaagggag agggagagtg tcctgcgccg ggagcaagag gtkscagagg agcggagaaa 180
tgctctcttc ccagaggtct tctccccaac gccagatgag aactctgacc agaactccag 240
gagtcctcc caggcatccg gcatcacggg cagttactcg gtgtctgagt ctcccttctt 300
cagccccatc cacctacact caaacgtggc gtggacagtg gaagatycag tggacagtgc 360
tcctcccggg cagagaaaga aggagcaatg gtacgctggc atcaaccct cggacggtat 420
caactcagag gtcctggaag ccatacgggt gaccgcgtcac aagaacgcca tggcagagcg 480
ctgggaatcc cgcactctacg ccagtgagga ggatgactga gcctcgggat ggggcgcccc 540
ccccctgccc tgccctgacc ctctgtggaa ctgccaaagac catcgccaag cccccaccct 600
aggaaatggg tcctaggtcc aggatccaag aaccacagct catctgcca caatcccacc 660
atgggcacat ttgggactgt tgggtttttc gtttccggtt ctatcttct ttagaaatgt 720
ttctgccttt ggggtctaaa gcttttgggg atgaaatggg acccctgctg attctttctg 780
cttctaagac tttgccaaat gccctgggtc taagaaagaa agagacccgc tcctccactt 840
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agatcgcagc accttgaggg gctgcgggtc tgagggagga gacactcagc tcctccctct 960
gagaagtccc aagctgagag gggagacctg cccctttcca accctgggaa accatccagt 1020
ctgagggagg agggcaaaact cccagtgtct ggggtccctg tgcagccctc aaacccttca 1080
ccttggtgca cccagccaca cctggtggac acaaagctct cacatcgata ggatcccatg 1140
aggatggtcc ccttcacctg ggagaaaagt gaccagttt aggagctgga ggggggtctt 1200
tgtccccac ccccaaactg ccctgaaata aacctggagt gagctgcca aaaaaaaaaa 1260
aaaaaaaaaa aaaaaaaaaa 1279

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<210> 475

<211> 480

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (354)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (371)

<223> n equals a,t,g, or c

338

<220>
 <221> misc feature
 <222> (470)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (475)
 <223> n equals a,t,g, or c

<400> 475
 tgactcgcag tggagtcagt caacaaccca ggtctcctgg ctcttaagac gtttcctttt 60
 taatattata ggaatgggaa tgctggctcc ttttacagta ctgggccctt tacactgtac 120
 tgcatactcg ttttttcagt ggatatatga gcttcttgctc aaaattatgt ggggtcccatg 180
 aagaaacatc taaccagggg aagggggaag gattgagaca taagacgtac ttatataaga 240
 tttcttttaa gaattccaat cttggacatg tttaaattttt ttatattttc tcatgtttaa 300
 atctcagttc gtttttcattg ctgtgctcag cacgtaagtg tggggaaatg gacnaagggg 360
 gctgcgggaa ngaccgctgg ctgggctcaa catgcctgtg ccttttcccc ttcatgtgtt 420
 cttgtgtctg atgcatctct aacacagaat gacattttac tgtttttcan aaaanaacct 480

<210> 476
 <211> 947
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (3)
 <223> n equals a,t,g, or c

<400> 476
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 tcggggaaat ccaccgtggg cgccctgctg gcactctgagc tgggatggaa attctatgat 120
 gctgatgatt atcaccggga ggaaaaatcga aggaagatgg gaaaaggcat accgctcaat 180
 gaccaggacc ggattccatg gctctgtaac ttgcatgaca ttttactaag agatgtagcc 240
 tcgggacagc gtgtggttct agcctgttca gccctgaaga aaacgtacag agacatatta 300
 acacaaggaa aagatggtgt agctctgaag tgtgaggagt cgggaaagga agcaaagcag 360
 gctgagatgc agctcctggt ggtccatctg agcgggtcgt ttgaggatcat ctctggacgc 420
 ttactcaaaa gagagggaca ttttatgccc cctgaattat tgcagtccca gtttgagact 480
 ctggagcccc cagcagctcc agaaaaacttt atccaaataa gtgtggacaa aaatgtttca 540
 gagataattg ctacaattat ggaaacccta aaaatgaaat gacaatgatt ttgtatcagt 600
 ggtccaaaca gaactaagca taaatcattg tgccatccca aacctcgttc cagccgcctt 660
 gcccatacta gattctaaat gtttctaaag gcaaacccca atgtgtcaag acagacttgt 720
 ttaggtgtaa ttttaggaat tatgctggtt catcaggaag cagaggggga gttttaaaag 780
 tcaagcttaa attgaagttt aaattcatct ataaccaaat caaatgatca gaggaaattc 840
 tgtaatcaat gctggaaatc gttacattgt ttagaacatt cttgctcatg cctgtattttg 900
 cacaaataaa tgaaacttcg ctgtcaaaaa aaaaaaaaaa aaaaaaa 947

<210> 477
 <211> 585
 <212> DNA

339

<213> Homo sapiens

<220>

<221> misc feature

<222> (547)

<223> n equals a,t,g, or c

<400> 477

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accaggacca cggggcctgg ctgcgcggcg gggatgtgtg gctggacagc tgccgggtttg 60
ctgacaatgg cattggcctg accctggcca gtggtggaac cttcccgtat gacgacggct 120
ccaagcaaga gataaagaac agcttggttg ttggcgagag tggcaacgtg gggacggaaa 180
tgatggacaa taggatctgg ggccctggcg gcttggacca tagcggaagg accctcccta 240
taggccagaa ttttccaatt agaggaattc agttatatga tggcccatc aacatccaaa 300
actgcacttt ccgaaagttt gtggccctgg agggccggca caccagcgcc ctggccttcc 360
gcctgaataa tgcttggcag agctgcccc ataacaacgt gaccggcatt gcctttgagg 420
acgttccgat tacttccaga gtgttcttcg gagarcctgg gccctgggtc aaccagctgg 480
acatggatgg ggataagaca tctgtgttcc atgacgtcga cggctccgtg tccgagtacc 540
ctggctncta cctacgaaga atgacaactg gctggtccgg cacc 585

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<210> 478

<211> 3470

<212> DNA

<213> Homo sapiens

<400> 478

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aattcggcac gagaaggatc gggggccctcg ccgctctgtc tcattccctc gcgctctctc 60
gggcaacatg gcgggtgtgg aggaggtagc ggccctccggg agccacctga atggcgacct 120
ggatccagac gacagggaag aaggagctgc ctctacggct gaggaagcag ccaagaaaaa 180
aagacgaaag aagaagaaga gcaaagggcc ttctgcagca ggggaacagg aacctgataa 240
agaatcagga gcctcagtgg atgaagtagc aagacagttg gaaagatcag cattggaaga 300
taaagaaaga gatgaagatg atgaagatgg agatggcgat ggagatggag caactggaaa 360
gaagaagaaa aagaagaaga agaagagagg accaaaagtt caaacagacc ctccctcagt 420
tccaatatgt gacctgtatc ctaatgggtg atttcccaaa ggacaagaat gcgaataacc 480
accacacaaa gatgggcgaa cagctgcttg gagaactaca agtgaagaaa agaaagcatt 540
agatcaggca agtgaagaga tttggaatga ttttcgagaa gctgcagaag cacatcgaca 600
agttagaaaa tacgtaatga gctggatcaa gcctgggatg acaatgatag aaatctgtga 660
aaagttggaa gactgttcac gcaagttaat aaaagagaat ggattaaatg caggcctggc 720
atttcctact ggatgttctc tcaataattg tgctgcccac tatactccca atgccggtga 780
cacaacagta ttacagtatg atgacatctg taaaatagac tttggaacac atataagtgg 840
taggattatt gactgtgctt ttactgtcac ttttaatccc aaatatgata cgttattaaa 900
agctgtaaaa gatgtacta acactggaat aaagtgtgct ggaattgatg ttcgtctgtg 960
tgatgttggg gaggccatcc aagaagttat ggagtcctat gaagttgaaa tagatgggaa 1020
gacatatcaa gtgaaaccaa tccgtaatct aaatggacat tcaattgggc aatatagaat 1080
acatgctgga aaaacagtgc cgattgtgaa aggaggggag gcaacaagaa tggaggaagg 1140
agaagtatat gcaattgaaa cctttggtag tacaggaaaa ggtgttggtc atgatgatat 1200
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tgaacatacc atcctgttgc gtccaacatg taaagaagtt gtcagcagag gagatgacta 1500
ttaaacttag tccaaagcca cctcaacacc tttattttct gagctttgtt ggaaaacatg 1560

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340

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ataccagaat taatttgcca catgttgtct gttttaacag tggacccatg taatactttt 1620
atccatgttt aaaaaagaag gaatttggac aaaggcaaac cgtctaattgt aattaaccaa 1680
cgaaaaagct ttccggactt ttaaattgcta actgtttttc ccttccctgt ctaggaaaat 1740
gctataaagc tcaaattagt taggaatgac ttatacgttt tgttttgaat acctaagaga 1800
tacttttttg atattttatat tgccatatte ttacttgaat gctttgaatg actacatcca 1860
gttctgcacc tataccctct ggtgttgctt tttaaccttc ctggaatcca ttttctaaaa 1920
aataaaagaca ttttcagatc tgagagctac atctcaatgt ctgtgggttat aattctggac 1980
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tctacactga gacttttctg gcatagtggc taaaacaaga tctacacatg cataaaaaagg 2100
gacaatcacc ttttcttcat aaatatacag ctttaggaat atttcaccat tctttgtagg 2160
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gttcatgcct ggacatactg tcagggctgg gccctccagc tagctccttt ggggttgagt 3060
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tagaattgac ctttatgagt gaagactttt ggagctttta aagaccttgg cagtcatgat 3180
ctcaaaccaa ttaggagctc caagctccct tcccaggtaa ctggtgggag caatggcatc 3240
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aaaaattgta ttgtttgctt attagccatg tatctcttaa aattttgtta tgtttacaac 3360
gatgtacctt attggcaaca agttattagt ttgatgttta acaatagtgc ctttagtaaa 3420
ttattttaca actaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 3470

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<210> 479

<211> 637

<212> DNA

<213> Homo sapiens

<400> 479

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acgccttggc catcgctgaa aagtctcagg agttcttggg agcagataat cgccagctgc 60
ccaatgggtg ttacacaaact gcagagcagc gtccgaatgc ctacatccca gaagcagatg 120
ccactcttcc tttgccaaaa ccttatgggtg ctttggctcc ttttaaaccg agtgaacctg 180
gagccaatat gaggcacata aggaaacctg ttataaagcc agttgaaatc tgaatatgtg 240
aacaatcca ggctcttcaa ggaaaagact tcaaccaggc ttccttgtac ccacagggtg 300
aaaatgtgag cataatactt ctaatatatt tgataagtaa ggtaaccaca attagtcagc 360
aacagagtac aacagggttt ctattttacc accaactact atacctttca tgacgttgaa 420
tgggacatag aactgtccta catttatgtc aaagtatata tttgaatygc ttatatattt 480
tttttcactc tttatatatt gtacattcca gaaatttgta gtaggcaagg tgctataaaa 540
atgcactaaa aataaatctg ttctcaatga agtacggaaa aaaaaaaaaa aaaaaaaaaa 600
aaaaaaaaaa aaaaaaaaaa aaaaaaaggg cggccgcg 637

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341

<210> 480
<211> 1889
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (26)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (57)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1295)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1370)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1844)
<223> n equals a,t,g, or c

<400> 480
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gtctgggcga actgacgtgc cagttcatcc tgctgcatcg catcgatttc atcategttg 120
tactgatcgc cagaatcgta ctgattgcgc tgggcttcac gggctttttc ttccgcgcga 180
cgctgtgagg gcagcttaat accgtaagac gccagttcac gacgagttgg cagcgggata 240
cgtttcggtc gtggcaactg cggaccaatc cctcttttga cctgaggacg cggtcaccgc 300
ctatttgcca gactgaagac tggcgcggca acggttgccg cagccccgtc gccagtgtcg 360
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gaatcggttg ataccaggcc gcaagttggt caggttcacg ggctcgcttc tcttcaactt 540
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cagcggctca ttatattgca ctgcagctgc gcatattgtg actgctgtgg gtaaccttcc 900
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taattggcgc accgtttaat aatggatcgt attcgtcata ttctggctgc gttgcacgrt 1140
tgcccgaaaa tagacgtcgt cggggtcggc agccacaccg cgtgcagtgt aggtaatctc 1200

342

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ttcgtcatca tcccatccgc tttaccggag aacaacgcag cgtctgtttg cgcgcccatc 1260
ggattaatga atttttccgc caaccgtttt aacgnaccta agccgccgcg aagaatacgg 1320
gcacggcgtg attcatgctg tttgcccggtg attttcatct tcatactctn cgtcgtcttc 1380
atactcatct tcatcgaccc aggtatcatc gcgacgggta cgattactgg cgaagggtgag 1440
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aacgtcaggc ccgctgccc aacgcagagc agcgcaatag ttcccccgct actgtgtagc 1560
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ataycgtcag cgttgattgc cgccagacca caggaggtaa ggatgagcgc caaaacgcca 1680
atgatgcgta gcgaaacggc aaaataatca atgkmytcgt cgctggactg atgacgccag 1740
gcaaaccaac aaccgccgac aataatgacg ggaatgggtg aagccattca cgccaaaaat 1800
aaagaacagc gtatctgcca accacgcacc gggcatccca cctnaattat ggatagggtc 1860
atgccaggcc gtttgcgacc agctgggggt 1889

```

<210> 481

<211> 493

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (453)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (472)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (475)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (491)

<223> n equals a,t,g, or c

<400> 481

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taacgatttg tgttgtgaga ggcgcaactg cgattttctgc tgaacttggg ggcattttcta 60
cgacttttct ctcagctgag gcttttccctc cgaccctgat gctcttcaat tcggtgctcc 120
gccagcccca gctkggcgctc ctgagaaatg gatgggtcttc acaataacct cttcaatccc 180
ttctgactgg ttatcagtgc agtggtaatg atgaacacac ttcttatgga gaaacaggag 240
tcccagttcc tcctttttgga tgtaccttct cttctgctcc caatatggaa catgtactag 300
cwgttgccaa tgaagaaggc ttttggttcga ttgtataaca cagaatcaca aagtttcaga 360
aagaagtgct tcaaagaatg gatgggtcac tggaatgccg tctttggacc tgggcctggg 420
ttcctgggga attaaaattg ttacagcagc agnggtcaaa cagccaattt tnggncgtaa 480
aactggtgag ncg 493

```

<210> 482

<211> 473